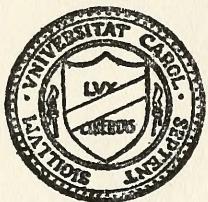




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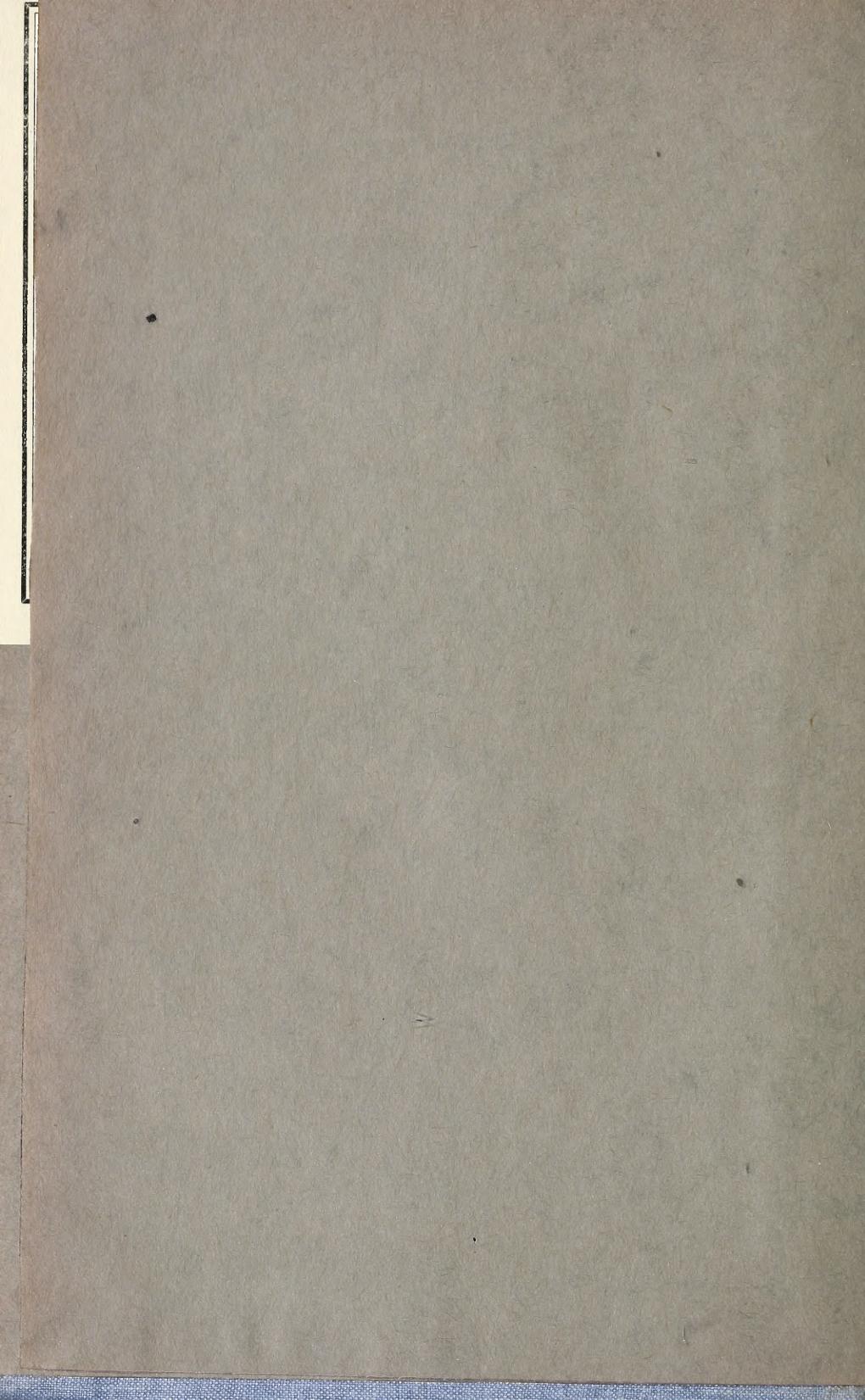
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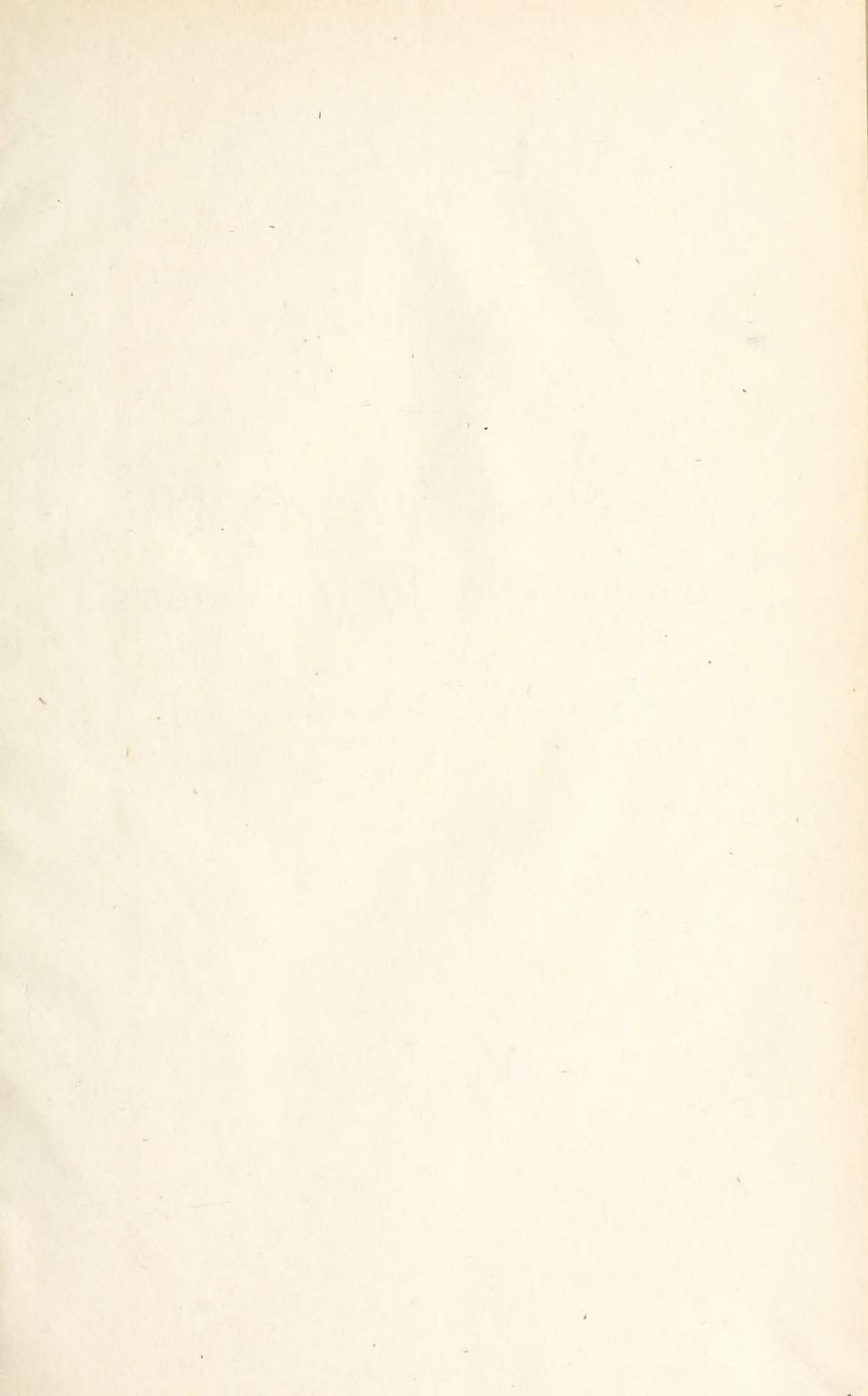


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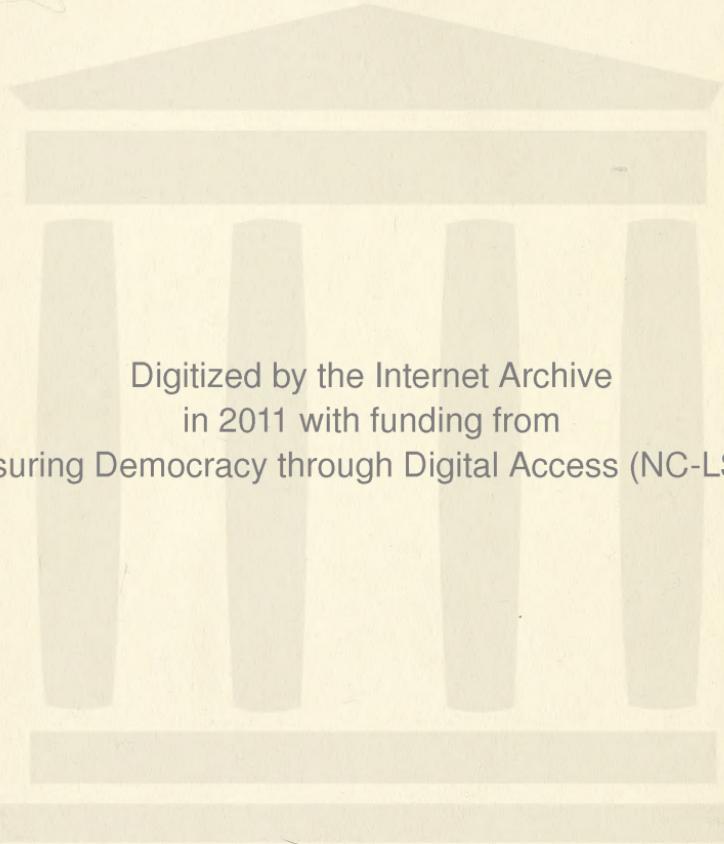


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REPORT
of
The North Carolina
Department of Agriculture

For the Biennium 1942-1944

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REPORT
of
The North Carolina
Department of Agriculture

For the Biennium 1942-1944



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NORTH CAROLINA AGRICULTURE BUILDING

**REPORT
OF
THE NORTH CAROLINA
DEPARTMENT OF AGRICULTURE**

FOR THE BIENNIAL 1942-1944

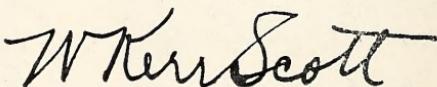
LETTER OF TRANSMITTAL

*To His Excellency, J. MELVILLE BROUGHTON,
Governor of North Carolina.*

SIR:

In compliance with Chapter 248, Public Laws of 1929, I submit the following report of the work of the Department of Agriculture for the biennium 1942-1944.

Respectfully,



Commissioner of Agriculture.

Raleigh, N. C.
December 12, 1944.

STATE BOARD OF AGRICULTURE

W. KERR SCOTT, *Commissioner*

Ex-Officio Chairman

Raleigh, N. C.

L. Y. BALLENTINE	Varina
W. I. BISSETTE	Grifton
L. L. BURGIN	Horse Shoe
CHARLES F. CATES	Mebane
CLAUDE T. HALL	Woodsdale
W. G. HARGETT	Richlands
D. R. NOLAND	Clyde
MISS ETHEL PARKER	Gatesville
J. H. POOLE	West End
LIONEL WEIL	Goldsboro

PERSONNEL
OF THE
STATE DEPARTMENT OF AGRICULTURE

W. KERR SCOTT, *Commissioner*

ADMINISTRATION

D. S. COLTRANE	<i>Assistant to the Commissioner</i>
MYRTHA FLEMING	<i>Executive Clerk</i>
MARY FRANCES LEE	<i>Senior Stenographer Clerk</i>
HELEN LOUISE ANDREWS	<i>Senior Stenographer Clerk</i>

ACCOUNTING OFFICE

A. R. POWLEDGE	<i>Chief Auditor</i>
B. JERRIE WHELESS	<i>Principal General Clerk</i>
CARRIE D. MCCALL	<i>Jr. Accounting Clerk</i>
Z. PAULINE GILBERT	<i>Senior General Clerk</i>
MARIE TEMPLE GRIMES	<i>Junior General Clerk</i>
MILDRED BURNICE DEAN	<i>Junior General Clerk</i>

PUBLICITY AND PUBLICATIONS

M. THOMPSON GREENWOOD	<i>Senior Publicity Specialist</i>
CARRIE MAE MANN	<i>Senior Stenographer Clerk</i>
JOSEPH A. HUNTER	<i>Janitor-Messenger</i>
LUVERDIS WELLS MAYE	<i>Messenger-Clerk</i>

INSPECTION

C. H. LUTTERLOH	<i>Chief Fertilizer Inspector</i>
G. C. BOSWOOD	<i>Junior Fertilizer Inspector</i>
LINDSEY ENNIS	<i>Senior Seed and Feed Inspector</i>
C. GRANT	<i>Senior Seed and Feed Inspector</i>
HARVEY C. MCPHAIL	<i>Senior Seed and Feed Inspector</i>
T. A. HOLCOMBE	<i>Senior Feed Inspector</i>
J. W. WOODSIDE	<i>Associate Botanist</i>

MARKETS NO. 1

R. B. ETHERIDGE	<i>Chief</i>
C. W. SHEFFIELD	<i>Principal Marketing Specialist</i>
REBECCA MERRITT	<i>Senior Stenographer Clerk</i>
ALDA JONES	<i>Junior Stenographer Clerk</i>
ETHEL YORK KIKER	<i>Associate Marketing Specialist</i>
L. MARION DILDAY	<i>Senior Marketing Specialist</i>
H. T. WESTCOTT	<i>Principal Marketing Specialist</i>
MEDDIE R. BUFFKIN	<i>Senior Marketing Specialist</i>
MRS. ELEANOR W. HEYWARD	<i>Senior Stenographer Clerk</i>
JOHN A. WINFIELD	<i>Senior Marketing Specialist</i>
RALPH BOGAN KELLY	<i>Senior Marketing Specialist</i>
MAY DAVIDSON	<i>Senior Stenographer Clerk</i>
MRS. NANCY BALDWIN CAIN	<i>Junior Stenographer Clerk</i>

MARKETS No. 2

GEORGE R. ROSS	<i>Principal Marketing Specialist</i>
ROBERT S. CURTIS	<i>Senior Marketing Specialist</i>
J. GORDON BLAKE	<i>Senior Marketing Specialist</i>
T. L. GWYN	<i>Principal Marketing Specialist</i>
D. S. MATHESON	<i>Principal Marketing Specialist</i>
HIXIE D. OLAFSON	<i>Senior Stenographer Clerk</i>

DAIRY

C. W. PEGRAM	<i>Dairy Specialist</i>
LUCILLE THOMAS STEPHENS	<i>Senior Stenographer Clerk</i>
ARCHER WEBSTER BOWMAN	<i>Junior Dairy Specialist</i>

ENTOMOLOGY

C. H. BRANNON	<i>Senior Entomologist</i>
J. A. HARRIS	<i>Senior Entomologist</i>
C. S. BRIMLEY	<i>Associate Entomologist</i>
D. L. WRAY	<i>Associate Entomologist</i>
P. G. CRADDOCK	<i>State Apiary Inspector</i>
PAULINE P. NEWSOM	<i>Senior Stenographer Clerk</i>
JOHN BOYCE RILEY	<i>Japanese Beetle Inspector</i>

SEED LABORATORY

WILLIARD HOLDEN DARST	<i>Senior Botanist</i>
S. D. ALLEN	<i>Junior Botanist</i>
MABEL V. ROBERTS	<i>Senior Seed Analyst</i>
MAGDALENE G. BRUMMITT	<i>Senior Seed Analyst</i>
DORIS ANN GARRETT	<i>Junior Seed Analyst</i>
STELLA WINSTON ETHEREDGE	<i>Senior Seed Analyst</i>
OKA E. THOMPSON	<i>Junior Stenographer Clerk</i>
MARY ALLEN NICHOLSON	<i>Junior Seed Analyst</i>
MARY ELIZABETH TURNER	<i>Junior Seed Analyst</i>

ANALYTICAL

E. W. CONSTABLE	<i>Principal Chemist</i>
E. T. HORD	<i>Senior Chemist</i>
W. E. MCNEILL	<i>Senior Food Inspector</i>
L. B. RHODES	<i>Senior Chemist</i>
L. M. NIXON	<i>Senior Chemist</i>
H. D. MATHESON	<i>Associate Chemist</i>
W. P. MATTHEWS	<i>Senior Chemist</i>
Z. B. BRADFORD	<i>Senior Chemist</i>
L. V. AMBURGEY	<i>Microscopist</i>
DAVID E. BUFFALOE	<i>Senior Chemist</i>
H. F. PICKERING	<i>Senior Chemist</i>
VELVA E. HUDSON	<i>Principal General Clerk</i>
HEBER B. HATCH	<i>Principal General Clerk</i>
MOSES W. LORD	<i>Laboratory Assistant</i>
GORDON POWELL	<i>Laboratory Assistant</i>
SARAH G. ALLEN	<i>Principal General Clerk</i>
JOHN J. FILICKY	<i>Associate Chemist</i>
CHARLES T. HOLLOWELL, JR.	<i>Associate Chemist</i>
JAMES MANLY	<i>Laboratory Aid</i>
BURNETT ALEXANDER BRITT	<i>Associate Chemist</i>
WILLIAM C. MCINTIRE, JR.	<i>Senior Food Inspector</i>
DORIS MARIE WILSON	<i>Junior Stenographer Clerk</i>

BIENNIAL REPORT

GEORGE HALL	Laboratory Aid
CHAS. H. GODWIN, JR.	Senior Food Inspector
HAZEL WILLIS	Senior Stenographer Clerk
J. S. PITTA RD	Senior Chemist
JOHN W. CRONE, JR.	Junior Chemist

CROP STATISTICS

FRANK PARKER	Chief Statistician
MRS. SARAH FENNER DRAKE	Senior Statistical Clerk
NANCY L. HOLLER	Senior Statistical Clerk
ELMA S. WYRICK	Senior Statistical Clerk
ESPY S. FOWLER	Senior Statistical Clerk
HERBERT G. BARNES	Senior General Clerk
GEORGE TRUETT DENTON	Senior General Clerk
BEAULAH E. BLEDSOE	Junior Statistical Clerk
CURTIS F. TARLETON	Senior Statistical Clerk
RUTH ALLEN	Junior Calculating Machine Operator
NONA BISHOP WEATHERSBY	Junior Calculating Machine Operator
MRS. EDITH SMALL PEARLMAN	Junior Calculating Machine Operator
WALTER HAROLD LINKOUS	Senior Statistical Clerk
BEULAH PEMBERTON PURCELL	Junior Calculating Machine Operator
NELLIE GRAY STEVENS	Junior Statistical Clerk
RUTH OGBURN	Junior Statistical Clerk

SOIL TESTING

IVAN E. MILES	Director
J. FIELDING REED	Senior Agronomist
ARTHUR GILES	Laboratory Aid
MRS. MARY C. H. CHALKLEY	Senior Stenographer Clerk
JULIA ROSE JOHNSON	Senior Stenographer Clerk
MRS. JANE G. BAISE	Laboratory Aid
MARGARET MURPHY	Junior Chemist

VETERINARY

WILLIAM MOORE	Chief
L. J. FAULHABER	Principal Veterinarian
W. R. BAYNES	Senior Veterinarian
GRACE R. JOHN	Senior Stenographer Clerk
FRANK S. HALL	Janitor Clerk
JAMES W. WILLIS	Junior Veterinarian
JOSEPH D. WOLF	Senior Veterinarian
THOMAS C. DEAL	Junior Veterinarian
WINIFRED HARDISON	Junior Laboratory Technician
EVELYN L. EPES	Junior Stenographer Clerk
W. W. KEEVER	Senior Hatchery and Flock Inspector
G. I. BULLOCK	Senior Hatchery and Flock Inspector
CHARLES HIGGS	Laboratory Aid

TEST FARMS

F. E. MILLER	Director
MRS. MARGARET T. HARRISON	Senior General Clerk
J. L. REA, JR.	Superintendent
A. P. LEFEVERS	Assistant in Field Crops
HERBERT W. ALLEN	Junior Herdsman
JOSEPH EDWARD FURLOUGH	Junior Farm Foreman
E. G. MOSS	Superintendent
CLIFTON M. BLACKWELL	Farm Foreman

COMMISSIONER OF AGRICULTURE

- 9

ELIZABETH FLOYD	<i>Senior Stenographer Clerk</i>
CHESTER KEARNEY	<i>Feed and Farm Laborer</i>
JOE L. RAND	<i>Foreman</i>
R. E. CURRIN, JR.	<i>Superintendent</i>
W. C. ALLSBROOK	<i>Senior Farm Foreman</i>
MRS. MARY C. YOUNG	<i>Junior Stenographer Clerk</i>
DEAN W. COLVARD	<i>Superintendent</i>
J. ERNEST LOVE	<i>Poultryman</i>
W. M. WHISENHUNT	<i>Farm Foreman</i>
R. L. YORK	<i>Dairyman</i>
W. W. ROSS	<i>Assistant Horticulturist</i>
HAZEL L. DRAKE	<i>Senior Stenographer Clerk</i>
SPENCE MONROE CORRELL	<i>Senior Dairyman</i>
CHARLES T. DEARING	<i>Superintendent</i>
D. P. SOUTHERLAND	<i>Senior Farm Foreman</i>
C. O. BOLLINGER	<i>Poultryman</i>
FRED STEVENS, JR.	<i>Junior Dairyman</i>
B. L. WILLIAMS	<i>Junior Stenographer Clerk</i>
J. W. HENDRICKS	<i>Superintendent</i>
ROSE E. BRADFORD	<i>Junior Stenographer Clerk</i>
VESTER NOAH BAIRD	<i>Senior Farm Foreman</i>

MISCELLANEOUS

WORTH JEFFRIES	<i>Junior Mail Clerk</i>
THEODORE R. BIRDSALL	<i>Janitor-Messenger</i>

COOPERATIVE INSPECTION SERVICE

D. A. BASS	<i>Egg Grader</i>
H. D. WILSON	<i>Egg Grader</i>
WM. B. JONES	<i>Egg Grader</i>

STATE WAREHOUSE SYSTEM

A. B. FAIRLEY	<i>Superintendent</i>
MRS. HALLIE K. MORROW	<i>Senior Stenographer Clerk</i>
J. B. HAYWOOD	<i>Cotton Classer</i>
E. L. UPCHURCH	<i>Senior General Clerk</i>
A. W. OUTTERBRIDGE	<i>Senior Warehouse Examiner</i>
HAZEL K. COBB	<i>Junior General Clerk</i>
GERTRUDE V. TANNER	<i>Senior Stenographer Clerk</i>
A. R. PHELPS	<i>Cotton Gin Inspector</i>

HOG CHOLERA WORK

EARL J. SPLITTER	<i>Junior Veterinarian</i>
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CREDIT UNION

D. R. GRAHAM	<i>Supervisor</i>
A. S. BYNUM	<i>Junior Auditor</i>
MRS. DAVID STREGER	<i>Senior Stenographer Clerk</i>

N. C. STATE FAIR

J. S. DORTON	<i>Manager</i>
G. C. ELLIS	<i>Custodian</i>

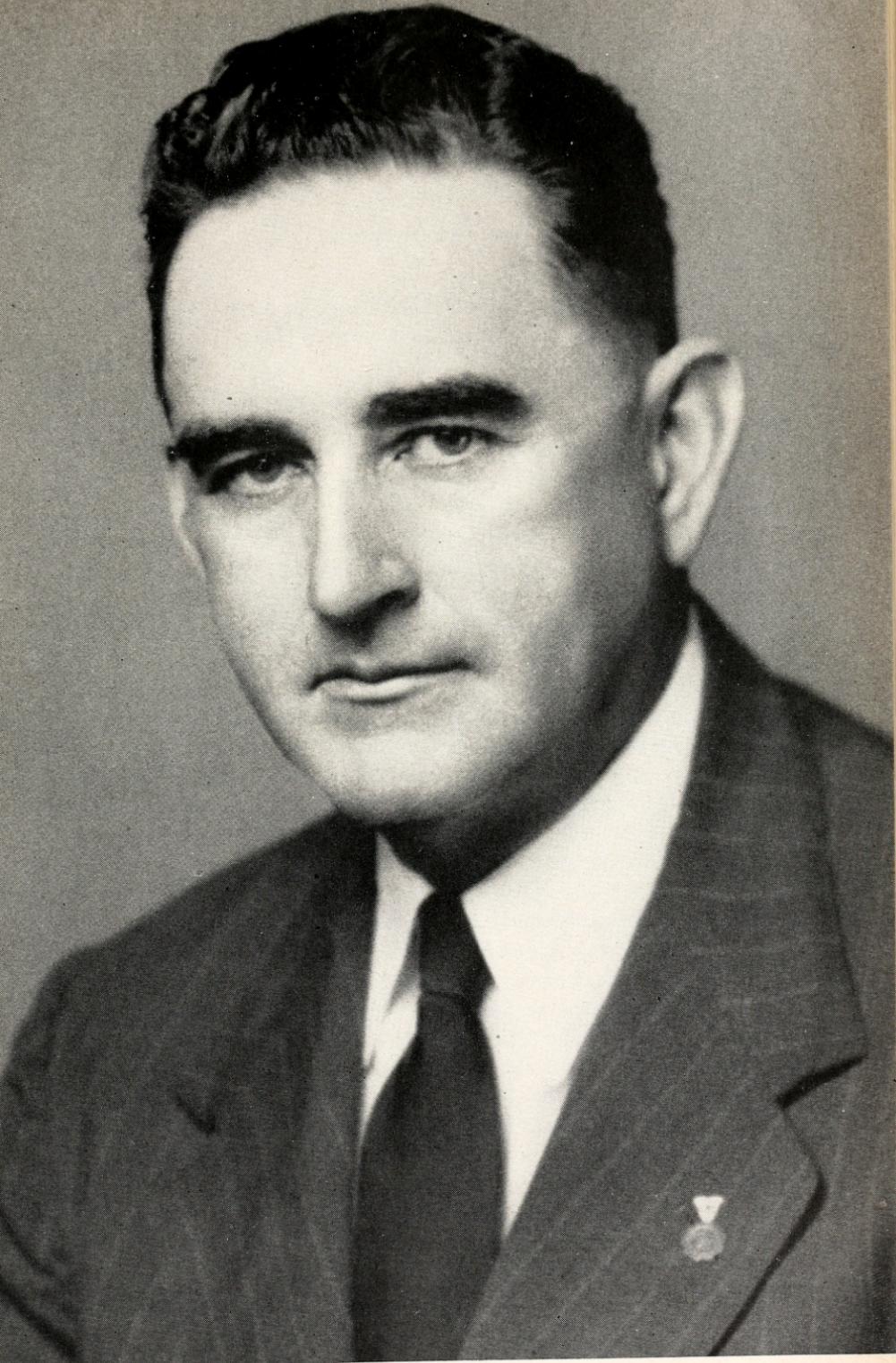
BIENNIAL REPORT

MUSEUM

H. T. DAVIS	<i>Director</i>
H. H. BRIMLEY	<i>Senior Curator</i>
MARY KNIGHT	<i>Principal General Clerk</i>
F. B. MEACHAM	<i>Junior Curator</i>
OWEN WOODS	<i>Janitor</i>
ROSIE LEE TERRY	<i>Maid</i>

WEIGHTS AND MEASURES

C. D. BAUCOM	<i>Superintendent</i>
H. W. HOOD	<i>Inspector</i>
JOHN I. MOORE	<i>Senior Inspector</i>
S. M. WOOLFOLK	<i>Inspector</i>
DORIS E. POWELL	<i>Junior Stenographer Clerk</i>
ELTON PHILLIPS	<i>Inspector</i>
J. T. JACKSON	<i>Junior Inspector</i>
T. WAVELY LUCAS	<i>Helper</i>



W. KERR SCOTT
Commissioner of Agriculture

BIENNIAL REPORT
OF THE
NORTH CAROLINA DEPARTMENT
OF AGRICULTURE

By W. KERR SCOTT
Commissioner of Agriculture

All of the twenty-four months covered by this report were war months, and these days of war brought hardships to the State Department of Agriculture as well as to the hundreds of thousands of people of North Carolina whom it endeavors to serve in every way possible. Taking a page from the book of war of our 300,000 farmers, the Department has attempted not only to carry on its regular services, but to expand them to meet the needs of the time—despite changing conditions, a shortage of necessary materials, and a serious lack of adequate employees.

The Department has assisted farmers and others with their wartime marketing problems—and they have been many. The numerous regulations, floors, and ceilings which appeared on the scene soon after Pearl Harbor added to the difficulties of stepped-up production. The various divisions of the Department did everything possible to assist in the proper interpretation of these rules, and when the regulations appeared unfair the Department used its influence to bring about changes which ultimately meant thousands of dollars to North Carolina farmers.

Scores of trips were made to Washington and to other points throughout the Nation in the interest of securing higher ceilings, higher floors, and more feed, more labor, and more equipment for our farm friends. There has been constant cooperation between this Department and other agencies—both military and civilian—in solving the numerous problems with which agriculture has been faced since July 1, 1942. All the divisions have made concrete and able contributions to the war effort.

The Statistics division furnished information for the foundation stones in the establishment of crop goals, and without these figures the State War Board would have been at a loss as to how to proceed with the organization of plans with which to meet the demands for more and more production. It has been

a pleasure for us to work with the State War Board. Increased production created great problems of distribution, and this meant more work for the Markets officials, but they responded admirably in rendering advice and assistance to producers old in the business and also to those who were relatively inexperienced.

The revolving fund set up to render aid in the marketing of sheep, eggs, beef cattle, poultry, and sweet potatoes has proved a great boost for the overall progress of agriculture in this State. This fund was handled by the Markets division. The division also gave assistance in the carrying out of far-reaching projects in the construction of processing and dehydration plants and in the establishment of auction produce markets in the mountain truck crop areas.

Dairy farmers of the State have been helped immeasurably by the Veterinary and Dairy divisions, one keeping disease at a minimum and the other carrying on an active Babcock test control program. Bang's disease, brought under control by the Department during the 1940-42 biennium, has not been allowed to lift its head again as an obstacle to the forward march of the dairy industry.

Three new test farms were purchased during the past two years—in Washington, Ashe, and Haywood counties—and as the biennium ended ambitious plans for these experiment stations in the post-war years were being formulated.

Using funds from the sale of the Mountain Test Farm at Swannanoa, the Department purchased at a cost of \$45,000 287 acres of land for the relocation of the farm east of the city limits of Waynesville. In Ashe County, at Transou, 410 acres were bought for \$24,000. The new Tidewater Test Farm, which succeeds the old Blacklands Station at Wenona, embraces 2,000 acres, 250 of which have been placed in cultivation. It is situated five miles east of Plymouth.

The public has been protected against bad scales, faulty weights, sub-standard feeds and fertilizers, contaminated foods and drinks, mislabeling, and short weight by the division of Chemistry and Weights and Measures. Unscrupulous dealers attempted to inveigle a gullible public into purchasing sub-standard items in the days of high wages and a reduction in commodities, but these divisions, operating with a skeleton force, did admirable work. C. D. Buacom, Weights and Measures superintendent, noted a sharp increase in the percentage

of scales, dry measures, and packages approved during the two years by his division. Dr. E. W. Constable, new head of the Chemistry division, showed himself to be aggressive in the apprehension of those manufacturers and dealers who attempted to sell to the consumer "economic cheats." Hundreds of tons of food unfit for human consumption were destroyed or embargoed.

The Department, through its Soil Testing division, advises farmers as to the condition of their soil, what it needs to make it more productive, and the types of crops and fertilizers needed for maximum production. Probably the brightest portion of the soil testing program during the biennium was the increased cooperation of this division with the Experiment Station, which was brought about by the placing of the director under the joint employment of the two agencies. As Dr. I. E. Miles, head of the division, points out in his report, this close cooperation will result in "a better understanding of the entire program and will further stimulate research work in this field."

W. H. Darst assumed the leadership of the Seed Laboratory in November of 1943, succeeding J. W. Woodside, who is now with the Department as a feed and seed inspector. From July 1, 1942, to June 30, 1944, this division analyzed 24,968 samples of seed—despite a 50 per cent runover in the personnel of the division in this time. Plans were laid to improve the laboratory with standardized equipment and qualified personnel. Possessed with ambitious leadership and forward-looking ideas, our Seed Laboratory division should by the end of the next biennium be one of the most modern in the South.

The Credit Union division organized the following groups: urban community, one white and six Negro; rural community, six Negro; Government employees, three white; printing and binding, one white; paper manufacturing, one white; newspapers, one white.

In the two years, there was an increase in assets of the 146 credit unions, a decrease in loans, and consequently a great increase in cash on hand. By June 30, 1944, approximately 25 per cent of the total assets of the credit unions had been invested in war bonds, a record of which the division and the Department is justifiably proud. Total assets of the unions on June 30, 1944: \$2,527,915.99.

Through its Museum division, the Department provided educational entertainment to approximately 30,619 Army and Navy

visitors. In this way, the State Museum served as an outstanding advertisement for North Carolina and for the Department of Agriculture.

The activities of this division have been many and varied. The painting and renovation program added greatly to the value and beauty of the State Museum. "Birds of North Carolina," published in 1941, has, according to Museum Director Harry Davis, "more than met optimistic expectations." All in all, the past biennium was probably the most successful this division has enjoyed in many years. The valuable projects carried out by it are too numerous to discuss in this summary.

Although the number of warehouses licensed under the State Warehouse System was less than during the previous biennium, there was an increase in the total capacity of the warehouses licensed. A total of 97 warehouses with a storage capacity of 572,000 bales were licensed. An important feature of the activities of this division was the purchase of \$82,000 in war bonds.

In addition to its regular work, the Entomology division carried on an ambitious project designed to bring under control the infestation of the white-fringed beetle in the eastern section of the State. This project has been carried on in cooperation with the United States Department of Agriculture.

An inspection survey which covered 84 counties in the State was carried on in 1943, involving a total of 1,875 man days. In inspection activities through the last months of the biennium, a radius of approximately 50 miles of all known infested points was covered.

There was a reduction of 69 per cent in soil populations of the larvae as of January 1944—largely as a result of thousands of man hours devoted to the ultimate control of the white-fringed beetle.

The Publications division in the biennium increased the circulation of the Agricultural Review from 30,000 to more than 70,000, supervised the editing of the numerous publications of the Department, provided daily material for radio, weekly and daily newspapers, and participated in numerous projects carried out by the other divisions.

Due to limitations on travel and the demands of the war, there was no State Fair during the biennium, the buildings at the fair grounds being rented for the storage of farm commodities.



ADMINISTRATIVE AND REGULATORY ACTIVITIES

1942-1944

D. S. COLTRANE
Assistant Commissioner

North Carolina farmers can well be proud of the part they have played and are playing in World War II. The Lord has been good to us during this biennium by sending favorable weather, and we have made the most of the opportunity by producing, in spite of serious shortages of labor, farm machinery, fertilizer, and other essentials, the greatest volume of food and fiber in the history of the State. Food production in the State and nation has increased each year since the beginning of the war.

The splendid achievements in food production during the last two years are the result not only of the efforts of our farmers in the face of seemingly superhuman physical obstacles, but also of the efforts of food processors and food distributors in handling an unprecedented volume of commodities from the farms through the processing plants and into the channels of distribution; also to the efforts of our feed and fertilizer manufacturers in the distribution of large volumes of feed and fertilizer with a shortage of ingredients and labor.

PLENTY OF FOOD FOR MILITARY AND HOME USE

As a result of these combined efforts in the State and nation, our soldiers, sailors, and marines on all fronts are better fed than any others in this war. Even though a good per cent of our food has gone to our Armed Forces and to our Allies, our total civilian supply of food is actually greater than it was before the war. More people in our civilian population are better fed than ever before.

INCREASE OVER THE PRE-WAR PERIOD

Crops: Corn, .08%; wheat, 25%; oats, 23%; barley, 254%; cotton, .09%; tobacco, .08%; Irish potatoes, 33%; lespedeza

(seed), 66%; lespedeza (hay), 37%; soybeans (for beans), 86%; peanuts, 25%.

Livestock: Cows and heifers, 10%; hogs on hand (Jan. 1), 35%; chickens on hand (Jan. 1), 59%; commercial broilers raised, 253%; total egg production, 48%; pig crop, 49%; milk production, 11%.

There has been a material increase in acre yields in the last fifteen years as shown by the following table. This table compares the average crop yield from 1924 to 1933 with the average of 1942-43 and gives the percentage of increase.

	1924-33 Aver.	1942-43 Aver.	1942-43 Av. % of 10-Yr. Av.
Cotton	267 lbs.	374 lbs.	40%
Tobacco	695 lbs.	951 lbs.	44%
Corn	17.6 bus.	20.5 bus.	20%
Wheat	10.6 bus.	13.7 bus.	32%
Peanuts	1,007 lbs.	1,198 lbs.	13%

CASH INCOME

CASH INCOME FROM CROPS AND LIVESTOCK AND GOVERNMENT PAYMENTS

10-year average 1924-33	\$214,298,000
2-year average 1940-41	258,576,000
2-year average 1942-43	493,818,000
Increase 1942-43 over 10-year average	130%
Increase 1942-43 over 1940-41 average	91%

By and large, North Carolina farmers are satisfied with the present general level of prices received for farm products. Our farmers generally appreciate the fact that after paying expenses, they have more net income than during the pre-war period. Dairy farmers have not received increases in milk prices commensurate with increased costs. Feed prices have advanced 40 to 50 per cent and labor 70 to 80 per cent with only a 15 to 20 per cent increase in milk prices. The War Food Administration has finally come to the rescue of the dairy farmers by giving a subsidy that averages around 80 cents per hundred pounds of milk.

The dairy industry has made outstanding gains during the war period. The production of milk sold to buying plants has increased from 205,047,914 pounds in 1941 to 288,891,610 pounds in 1944. The figures do not include the production of producer-distributors which has also greatly increased. The State ranks 25th in number and value of milk cattle and 22nd in the total number and value of livestock. North Carolina ranks 12th in the manufacture of ice cream for 1943 (9,437,000 gallons).

PERSONNEL

The Department employs a total of 254 persons at an average salary of \$1,449 per person. The turnover of employees during the biennium 1942-44 has been about 35 per cent, which is exceedingly high. This has been due to two reasons: First, military service; and second, more attractive salaries offered by the Federal government and commercial agencies and companies.

It is gratifying to close the biennium with the feeling that our employees have built and maintained a good record of diligence, efficiency, and interest in their work. They have proved their loyalty to the Department as well as to the countless thousands of citizens throughout the State whom the Department has endeavored to serve. Many workers could have obtained more remunerative positions during the war period; therefore, it occurs to us that the Legislature should take cognizance of this fact and grant reasonable salary increases during the coming biennium.

Unfortunately for the Department, many of our best trained employees have gone to other fields of work as well as into the armed forces of the nation. It has been difficult, in fact, impossible, to replace them with others who are qualified due to our low salary scale as compared with other agencies. This is particularly true of the clerical help in the Department. The starting salary for a junior stenographer is so low that we cannot obtain a well-trained college graduate; therefore, we have during the biennium been forced to employ high school graduates who very seldom make capable, proficient workers. Since the State encourages education, a college education, if you please, it occurs to us that the State should pay salaries that will attract college graduates.

Trained personnel should be maintained and adequate salaries should be paid commensurate with the standard of living prevailing; otherwise, the regulatory, inspection, control, and marketing programs of the Department will suffer irreparable losses.

Over a period of years sizeable investments have been made in preparing and training the Department's staff in specialized work, and if these investments are to be protected, nominal salary increases must be made.

Living expenses are up materially from two years ago; income taxes are steadily climbing; all of which emphasizes the need for salary increases which are essential to the maintenance of reasonable living standards.

MILITARY SERVICE

We take pride in listing those of our former employees who are in Military Service:

Administration—C. P. Deyton, Robert Harris, and Louis H. Wilson. *Inspection*—E. J. Harrington.

Markets—Albert Banadyga, B. H. Barnes, Lloyd W. Boney, W. A. Bowling, Johnnie Capps, C. C. Cheves, Gilbert Clark, William Leary Cooper, L. D. Edwards, William H. Fussell, G. G. Gibson, E. G. Hargis, J. K. Harrington, W. P. Hedrick, Y. W. Howard, C. S. Howell, G. C. Hunsucker, J. P. Jenrette, F. H. Jones, T. D. Litchfield, William E. Long, Rommie Mallison, Lewis Maness, William H. Moyer, G. N. Noble, H. C. Oglesby, J. J. Page, Shell G. Scott, J. D. Shields, C. A. Summerlin, Jr., W. A. Thompson, J. Worth Turner, A. A. Wall, Ralph L. Warren (honorable discharge), George Wheelus, and J. S. Winstead.

Entomology—C. H. Hill. *Seed Laboratory*—Neal W. See-gars, J. D. Simmons. *Analytical*—James A. Belton, Edwin L. Combs, W. C. Hammond, Jr., Rufus G. Marshbourne, Charles C. Oates, Jr., J. S. Pittard (honorable discharge), L. W. Purdy, Charlie L. Sellars. *Crop Statistics*—W. T. Garriss, William T. Wesson. *Veterinary*—Eugene Anderson, Wayne D. Collins, John H. Hoins, III, C. B. Randall.

Soil Testing—Frank H. Brown, Ivan E. Miles (honorable discharge), Grafton C. Price. *State Warehouse System*—Robert S. Pou, Joe E. Trowbridge, John S. Vaughan. *Weights and Measures*—Joseph P. Crawford, Wade M. Maness, Robert W. Parker, George S. Turner.

COOPERATION

A fine spirit of cooperation exists between the Department and other agricultural agencies and industries serving the agricultural interests of the State.

Whenever regulatory, inspectional, and control problems have arisen, the Department of Agriculture in cooperation with North Carolina State College, the United States Department of Agriculture, the North Carolina Farm Bureau Federation,

the Grange, representatives of industry and others, have united in an effort to formulate practicable programs that will result in fair, impartial, and worthwhile contributions to the farm life of the State.

The necessity of cooperation with the United States Department of Agriculture has been implemented by the war. This cooperation has resulted in obtaining increased allocations of feed ingredients, especially protein meals and feed wheat.

REVENUE

The detailed financial statement shows the sources and amounts of revenue collected during the biennium. The total receipts for the two years amount to \$1,535,254, as compared with \$1,156,189.32 for the previous biennium, which is an increase of \$379,064.68. This is accounted for largely by the increased use of feed and fertilizer.

Receipts of the Department for the fiscal year 1942-43 were \$751,915 while the expenditures amounted to \$566,847. Receipts exceeded expenditures by \$185,068. In the fiscal year 1943-44 receipts were \$783,339, while expenditures amounted to \$638,783. Receipts exceeded expenditures by \$144,556. Receipts for the biennium exceeded expenditures by \$329,624.

FERTILIZER CONTROL

Inasmuch as North Carolina uses more than one-seventh of all the fertilizer used in the nation, the Department realizes that no part of its work is more important than strict enforcement of the Fertilizer Law.

FERTILIZER SALES

Consumption of commercial mixed fertilizer and fertilizer materials based on tax tag sales for the fiscal year 1942-43 was 1,292,655 tons, whereas the consumption for the year 1943-44 was 1,393,690 tons. The tonnage for the biennium amounted to 2,686,345 tons which represents an increase from the previous biennium by 378,845 tons of 16 per cent.

FERTILIZER INSPECTION

Adequate fertilizer inspection service has been provided during the past two years; however, we do not have a sufficient

number of inspectors to get a sufficient number of samples desired from the farmers. An honest effort has been made to get samples from every company in proportion to the tonnage sold.

During the year 1942-43, 6,188 inspections were made, and during the year 1943-44, 5,744 inspections, or a total of 11,932 inspections for the biennium. This is compared with a total of 13,835 inspections for the previous biennium. During the year 1942-43 our inspectors secured 5,513 official samples. During the year 1943-44, they secured 5,083 samples, or a total for the biennium of 10,596. One sample of fertilizer was taken for approximately each 200 tons sold. It is our opinion that more samples should be taken—at least one sample for each 100 tons sold. However, this would necessitate the employment of more inspectors, as well as increased laboratory facilities and personnel.

FERTILIZER OF GOOD QUALITY

Reasonable quality in the fertilizer sold in the State is indicated by the fact that during the biennium penalties were assessed on 1,019 lots of fertilizer obtained from 10,596 official samples analyzed and reported, which means that approximately 10 per cent of the fertilizer was subject to a penalty. If inspection figures are indicative of the fertilizer movement as a whole, this means that 90 per cent of the fertilizer sold in the State either met the guaranteed analysis or was found within the variations allowed by the Fertilizer Law.

PENALTIES

Penalties have been assessed in accordance with the provisions of the law. However, some few penalties are waived if and when in our judgment the penalty is too technical and when the agronomic value of the fertilizer as shown by the analyses is more than the guaranteed value. There are cases when we are satisfied that an error was made in sampling, and, in that event, the sample is voided.

Penalties for the biennium have been assessed on 1,019 lots for a total of \$26,602.91. Penalties paid to users of the fertilizer amount to \$14,135.12 and to the Department \$12,467.79. Penalties are paid to the Department when the users cannot be determined.

\$1,665,533.90 IN EXCESS PLANT FOOD

A study of the average value of fertilizer for the biennium reveals that manufacturers gave North Carolina farmers an average of 62 cents per ton more plant food than was guaranteed, or an excess of plant food value of \$1,665,533.90.

These facts substantiate the value of rigid, strict, practical, enforcement of agricultural laws and are indicative of the protection given farmers as well as manufacturers.

NITROGEN SHORTAGE

The demand for nitrogen in the manufacture of munitions created a 25 per cent shortage in agriculture during 1943. War Production Board Order No. M231 required farmers to use a 2 per cent nitrogen grade when a 3 per cent grade was used the previous year, and a 3 per cent grade when a 4 per cent grade was used in 1942. Our farmers patriotically complied with the order and very satisfactory crops resulted. Nitrogen production increased to such an extent that we had an adequate supply in 1944.

3-8-3 GONE TO WAR

The popular, but uneconomical, grade of fertilizer, 3-8-3, has gone to war, or at least it has not been on the approved grade list for the past two years and it has likely gone to stay. The grade 3-8-5 has been eliminated from the general crop list, but due to popular demand is approved as a tobacco grade. This low analysis grade should be eliminated as it contains too much worthless filler material. The fertilizer sold in the State during the biennium averaged approximately 18 units of plant food, compared with 15 units five years ago. About 80 per cent of the fertilizer sold in the State is of grades recommended by the Experiment Station, compared with 40 per cent five years ago. Our farmers are intelligently using more and better grades of fertilizer to good advantage.

FEED SALES

Computed from the sale of tax tags, there were 1,677,315 tons of feed sold in the State during the biennium compared with 837,438 tons for the previous biennium, an increase of 839,350 tons, which is an increase of 101 per cent.

There were 229,527 tons of cottonseed meal sold during the biennium compared with 225,085 tons for the previous biennium.

FEED INSPECTIONS

From all sections of the State our seven inspectors have collected 2,500 samples of mixed feed. A reasonable number of samples were collected from each company and extra precautions were taken to secure samples of brands previously found below the guaranteed analysis.

During the biennium a total of 21,175 bags of feed were withdrawn from sale for various violations of the Feed Act, and the registration of 6 brands were cancelled. Where the violations were of a technical nature, the feed was released for sale if and when the law had been complied with; however, 449 bags were returned to the manufacturer.

COTTONSEED MEAL

The quality of cottonseed meal sold in the State during the biennium has not been up to the standard expected. Many manufacturers have averaged below their guaranteed analyses. This is especially applicable to the meal sold during 1943-44. Unless the situation is corrected, we shall have to take more drastic action; however, penalties have been assessed in all cases where the tolerances were exceeded.

THE AMENDED FEED ACT

The North Carolina Feed Law was amended by the 1943 General Assembly to provide for:

- (1) A system of penalties for protein and fat deficiencies, excess fiber, and the substitution of ingredients.
- (2) Annual tonnage report to the Department of the different types of feed sold.
- (3) Twenty-five dollar registration fee in lieu of inspection tax for feed sold in five-pound or smaller sized packages.

PENALTY PROVISIONS OF LAW EFFECTIVE

Penalties for deficiencies and mislabeling were adopted because court procedure was found to be slow and ineffective, whereas the penalty provisions of the Fertilizer Act had proved

quite effective. From the date of ratification, February 24, 1943, to June 30, 1944, penalties have been assessed against 343 lots of feed, representing a total of 38,173 bags. The penalties aggregate \$7,601.92.

The penalty is paid to the consumer if and when he can be determined. If not, it is paid to the Department as an imprest fund.

The amount of imprest penalties totals 3,607.62. The amount paid to consumers totals \$3,994.30.

FEED SITUATION

Using our analyses, both chemical and microscopic, as an index, the feed sold in the State during the biennium, by and large, equaled the guaranteed analyses. However, there has been a shortage of many valuable feed ingredients which has necessitated some substitutions of ingredients. There has been such a shortage of corn and an increased use of wheat that it has been necessary to lower the fat standards in most all special purpose feeds. These standards have been lowered only when approved by specialists of the Experiment Station. The Department has endeavored to see that all feeds were correctly labeled and have insisted that if a substitution was necessary, it must be of ingredients of equal value. Some few manufacturers became flagrant violators of the law, and, in that event, they were cited to appear in Raleigh before officials of the Department for a hearing. These hearings have proved quite effective. Not a single manufacturer has been requested to appear for a second hearing.

We have assisted the feed manufacturers of the State during the war period in obtaining feed ingredients, especially feed wheat and protein meals, and even though there has been a shortage of ingredients, feed sales for the biennium increased more than 100 per cent.

By and large our farmers have received a sufficient quantity of feed, of reasonably good quality and correctly labeled.

SUMMARY OF FEED AND FERTILIZER CONTROL FOR
THE BIENNIAL

FERTILIZER

Number of inspections	11,932
Number of official samples	10,596
Number of tons sampled	117,668
Number of "stop sale" orders issued	57
Number of bags seized	4,547
Number of penalties assessed	1,019
Aggregate amount of penalties	\$26,602.91

FEED

Number of inspections	22,310
Number of official samples	2,500
Number of bags sampled	306,878
Number of samples analyzed	3,646
Number of "stop sale" orders issued	253
Number of bags seized	21,175
Number of penalties assessed	343
Aggregate amount of penalties	\$7,601.92
Number of legal hearings	4

NORTH CAROLINA CROP, LIVESTOCK AND POULTRY PRODUCTION

CROPS

YEAR	CORN		WHEAT		OATS		BARLEY	
	Acres (000)	Prod. (000)	Acres (000)	Prod. (000)	Acres (000)	Prod. (000)	Acres (000)	Prod. (000)
1940 -----	2,441	47,600	443	6,645	235	6,110	16	384
1941 -----	2,392	52,624	474	7,347	252	6,552	27	634
1942 -----	2,296	47,068	517	8,014	265	6,625	46	1,058
1943 -----	2,319	51,018	465	5,812	278	5,977	45	922

LIVESTOCK AND POULTRY NUMBERS

January	Cattle (all)	Hogs	Horses and Colts	Mules and Colts	Poultry
1					
1940 -----	595,000	1,205,000	76,000	301,000	10,014,000
1941 -----	613,000	1,133,000	78,000	298,000	10,337,000
1942 -----	644,000	1,144,000	80,000	298,000	12,068,000
1943 -----	696,000	1,350,000	83,000	298,000	14,156,000
1944 -----	752,000	1,529,000	85,000	295,000	16,474,000



A. R. POWLEDGE

ACCOUNTS

A. R. POWLEDGE

The financial report of the Department and the various divisions is as follows:

DEPARTMENT OF AGRICULTURE Code 1101

STATEMENT OF DISBURSEMENTS

July 1, 1942-June 30, 1944

I. ADMINISTRATION

	1943-44	1942-43
Board of Commissioners	\$ 1,348.61	\$ 1,221.25
Salary—Commissioner	6,600.00	6,300.00
Salaries and Wages—Staff	9,960.76	21,821.38
Supplies and Materials	286.34	1,199.91
Postage, Telephone, Telegraph and Express	1,483.15	2,097.51
Travel Expense	2,011.89	1,605.27
Printing and Binding	318.35	6,904.17
Repairs and Alterations	28.28	134.44
General Expense	127.88	149.65
Equipment	50.00	235.83
Legislative Representative in Washington, D. C.	499.92	499.92
Tags		11,704.33
TOTAL	\$ 22,715.18	\$ 53,873.66

ACCOUNTING OFFICE

Salaries and Wages	\$ 6,558.84
Supplies and Materials	252.98
Printing and Binding	177.75
Repairs and Alterations	53.30
Equipment	75.18
TOTAL	\$ 7,118.05

PUBLICITY & PUBLICATIONS

Salaries and Wages	\$ 6,188.59
Supplies and Materials	354.68
Postage Permit "Agricultural Review"	1,104.00
Travel Expense	107.10
Printing "Agricultural Review"	5,069.29
Repairs and Alterations	74.45
Equipment	50.00
TOTAL	\$ 12,948.11

TOTAL ADMINISTRATION \$ 53,873.66

\$ 42,781.34

COMMISSIONER OF AGRICULTURE

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	1943-44	1942-43
II. INSPECTION		
Salaries and Wages	\$ 12,697.09	\$ 10,032.24
Salaries and Wages, Extra	4,882.81	5,133.14
Supplies and Materials	392.72	99.77
Postage, Telephone, Telegraph and Express	1,452.40	924.85
Travel Expense	15,814.03	18,517.94
TOTAL	\$ 35,239.05	\$ 34,707.94
III. MARKETS No. 1		
Salaries and Wages	\$ 27,689.53	\$ 32,791.56
Salaries and Wages, Extra	2,335.40	546.16
Supplies and Materials	387.46	555.26
Postage, Telephone, Telegraph and Express	1,181.40	1,032.10
Travel Expense	6,278.64	6,250.49
Printing and Binding	36.13	105.84
Repairs and Alterations	48.46	18.45
Market News Service	608.77	736.83
Subscriptions and Dues	150.00	138.50
Equipment	33.60	19.81
Leased Wire	789.40	776.40
TOTAL	\$ 39,538.79	\$ 42,971.40
III. MARKETS No. 2		
Salaries and Wages	\$ 22,375.14	\$ 23,872.18
Salaries and Wages (Temporary)	9,668.34	
Supplies and Materials	263.54	278.47
Postage, Telephone, Telegraph and Express	1,103.00	1,027.19
Travel Expense	11,753.49	8,054.25
Printing and Binding	79.30	122.08
Repairs and Alterations	10.00	6.70
General Expense	34.90	47.82
Equipment	56.25	24.25
TOTAL	\$ 45,343.96	\$ 33,432.94
TOTAL MARKETS	\$ 84,882.75	\$ 76,404.34
Refund from General Fund	22,671.98	
	\$ 62,210.77	
IV. CREDIT UNION		
Transfer to General Fund	\$ 2,500.00	\$ 2,500.00
V. DAIRY		
Salaries and Wages	\$ 7,338.00	\$ 6,918.00
Supplies and Materials	65.39	58.56
Postage, Telephone, Telegraph and Express	146.04	112.41
Travel Expense	1,941.69	1,836.68
Printing and Binding	40.50	39.14
Equipment		147.30
Workmen's Compensation	272.92	
TOTAL	\$ 9,804.54	\$ 9,112.09

BIENNIAL REPORT

	1943-44	1942-43	
VII. ENTOMOLOGY			
Salaries and Wages	\$ 15,314.66	\$ 14,778.00	
Supplies and Materials	81.54	193.42	
Postage, Telephone, Telegraph and Express	150.61	180.55	
Travel Expense	4,539.66	4,732.45	
Printing and Binding	149.55	74.26	
Subscriptions and Dues	78.15	85.30	
Equipment	8.51	58.50	
TOTAL	\$ 20,322.68	\$ 20,102.48	
VIII. SEED LABORATORY			
Salaries and Wages	\$ 13,385.93	\$ 17,836.25	
Supplies and Materials	347.71	242.50	
Postage, Telephone, Telegraph and Express	552.72	492.68	
Travel Expense	1,040.41	3,296.06	
Printing and Binding	655.95	467.15	
Repairs and Alterations	209.02	23.95	
Equipment	220.72		
TOTAL	\$ 16,412.46	\$ 22,358.59	
VIII. ANALYTICAL			
Salaries and Wages	\$ 52,350.59	\$ 46,096.24	
Supplies and Materials	3,168.42	2,854.03	
Postage, Telephone, Telegraph and Express	775.73	660.35	
Travel Expense	7,805.72	368.43	
Printing and Binding	3,693.29	500.00	
Repairs and Alterations	459.63	294.74	
Laundry	1.74	2.98	
Equipment	223.68	386.55	
General Expense	150.00		
TOTAL	\$ 68,628.80	\$ 51,163.32	
IX. CROP STATISTICS			
Salaries and Wages	\$ 18,421.69	\$ 14,884.90	
Salaries and Wages, Extra	2,188.28	3,566.15	
Supplies and Materials	148.04	128.49	
Postage, Telephone, Telegraph and Express	293.56	186.39	
Travel Expense	1,477.94	439.07	
Printing and Binding	4,255.85	2,548.24	
Repairs and Alterations	172.50	71.70	
Subscriptions and Dues	10.00	10.00	
Equipment	1,160.00	24.75	
Emergency War Work	3,346.51		
TOTAL	\$ 31,474.37	\$ 21,859.69	
MUSEUM			
Salaries and Wages	(Transferred to General Fund)	\$ 9,523.71	
Salaries and Wages, Extra		3.15	
Supplies and Materials		212.66	
Postage, Telephone, Telegraph and Express	See Financial Statement	148.78	
Travel Expense		77.48	
Printing and Binding		N. C. State Museum	67.92
Subscriptions and Dues		Code 6115	36.00
Equipment		315.09	
Renovation of Museum		950.06	
TOTAL		\$ 11,334.85	

COMMISSIONER OF AGRICULTURE

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X. SOIL TESTING	1943-44	1942-43
Salaries and Wages	\$ 8,291.05	\$ 8,897.50
Supplies and Materials	600.87	673.29
Postage, Telephone, Telegraph and Express	130.64	147.95
Travel Expense	738.92	838.74
Printing and Binding	10.84	3.00
Equipment	146.31	43.50
TOTAL	\$ 9,918.63	\$ 10,603.98

XI. BLISTER RUST CONTROL

Salaries and Wages	\$ 4,616.83	\$ 4,949.76
Supplies and Materials	22.77	49.18
TOTAL	\$ 4,639.60	\$ 4,998.94

XII. VETERINARY

Salaries and Wages	\$ 34,888.44	\$ 28,470.55
Salaries and Wages, Extra	1,935.00	9,872.16
Supplies and Materials	437.90	600.24
Postage, Telephone, Telegraph and Express	947.54	422.75
Travel Expense	15,503.51	20,694.79
Printing and Binding	199.32	195.48
Repairs and Alterations	3.00	2.50
General Expense	139.95	48.80
Equipment	101.41	
Clinic on Mastitis		
Diagnostic Laboratory		
TOTAL	\$ 54,156.07	\$ 60,307.27

XIII. TEST FARMS ADMINISTRATION

Salaries and Wages	\$ 5,100.00	\$ 5,030.00
Supplies and Materials	172.87	135.24
Postage, Telephone, Telegraph and Express	218.67	289.60
Travel Expense	700.27	863.24
Printing and Binding	74.34	69.61
General Expense	36.05	42.07
Insurance and Bonding	1,643.00	658.59
Workmen's Compensation	717.60	
TOTAL	\$ 8,662.80	\$ 7,088.35

BLACKLAND TEST FARM

Salaries and Wages	\$ 6,179.31	\$ 5,472.90
Supplies and Materials	2,357.63	2,784.61
Postage, Telephone, Telegraph and Express	89.40	73.69
Travel Expense	188.70	183.30
Motor Vehicle Operations	504.90	737.04
Repairs and Alterations	303.35	66.05
General Expense	616.96	648.81
Equipment	1,171.00	792.70
Additions and Betterments	623.99	
Purchase of Land	27,250.00	
TOTAL	\$ 39,285.24	\$ 10,759.00

BIENNIAL REPORT

TOBACCO TEST FARM	1943-44	1942-43
Salaries and Wages	\$ 12,822.14	\$ 11,171.58
Supplies and Materials	1,779.12	2,178.71
Postage, Telephone, Telegraph and Express	156.30	106.82
Travel Expense	56.28	36.03
Printing and Binding	2.00	7.60
Motor Vehicle Operation	69.92	82.96
Light, Power and Water	149.00	136.27
Repairs and Alterations	496.66	619.83
General Expense	299.25	350.63
Equipment	5.00	537.48
Additions and Betterments	11.39	622.62
TOTAL	\$ 15,847.06	\$ 15,850.53

UPPER COASTAL PLAIN TEST FARM

Salaries and Wages	\$ 11,974.25	\$ 12,213.66
Supplies and Materials	3,363.41	2,745.14
Postage, Telephone, Telegraph and Express	196.10	187.71
Travel Expense	236.60	248.35
Motor Vehicle Operation	944.63	846.79
Light, Power and Water	322.89	307.35
Repairs and Alterations	527.14	396.02
General Expense	6.25	450.00
Equipment	674.86	433.79
Additions and Betterments		100.00
TOTAL	\$ 18,246.13	\$ 17,928.81

MOUNTAIN TEST FARM

Salaries and Wages	\$ 9,605.74	\$ 9,769.98
Supplies and Materials	6,819.63	4,756.23
Postage, Telephone, Telegraph and Express	203.50	319.51
Travel Expense	847.67	658.51
Printing and Binding	61.76	16.91
Motor Vehicle Operation	725.43	489.95
Light, Power and Water	528.76	444.14
Repairs and Alterations	122.13	198.78
General Expense	4,100.00	3,060.23
Equipment	73.84	170.54
Additions and Betterments		800.00
Hog Experiment		
TOTAL	\$ 23,088.46	\$ 20,684.78

COASTAL PLAIN TEST FARM

Salaries and Wages	\$ 15,535.35	\$ 15,132.03
Supplies and Materials	7,961.56	4,457.00
Postage, Telephone, Telegraph and Express	326.44	394.13
Travel Expense	21.94	53.37
Printing and Binding	15.53	25.12
Motor Vehicle Operation	1,173.77	1,396.10
Light, Power and Water	954.51	720.76
Repairs and Alterations	254.35	342.94
General Expense	166.58	176.44
Equipment	1,107.44	647.98
Additions and Betterments		1,089.01
TOTAL	\$ 27,517.47	\$ 24,434.88

COMMISSIONER OF AGRICULTURE

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PIEDMONT TEST FARM	1943-44	1942-43
Salaries and Wages	\$ 9,472.60	\$ 8,917.33
Supplies and Materials	1,527.78	1,838.83
Postage, Telephone, Telegraph and Express	116.25	161.32
Travel Expense	345.29	409.67
Printing and Binding	2.50	27.65
Motor Vehicle Operation	354.53	399.01
Light, Power and Water	235.61	214.68
Repairs and Alterations	341.38	69.38
General Expense	45.16	125.80
Equipment	235.00	165.00
Additions and Betterments		
TOTAL	\$ 12,676.10	\$ 12,328.67
TOTAL TEST FARMS	\$145,323.26	\$109,075.02

XIV. MISCELLANEOUS

Salaries and Wages	\$ 1,869.17	\$
Custodial	6,480.00	6,480.00
Farmers' Convention		
Contribution to Retirement System	11,385.29	11,062.03
Tax Tags and Stamps	15,125.65	
Serum to be Resold	30,007.77	
Workmen's Compensation	56.50	
Reserve	(597.02)	
Purchase of Motor Vehicle	3,786.30	
Insurance and Bonding	134.07	
Motor Vehicle Operation	140.12	
Sheep Distribution Project		4,500.00
TOTAL	\$ 68,387.85	\$ 22,042.03

XVI. RABIES

Rabies	\$ 868.00	\$ 498.56
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XVII. JAPANESE BEETLE

Salaries and Wages	1,435.50	1,673.85
Wages, Trap Tenders	1,260.00	1,379.00
Supplies and Materials	9,191.57	8,843.18
Travel Expense	283.15	154.25
TOTAL	\$ 12,170.22	\$ 12,050.28

XVIII. EMPLOYEES' WAR BONUS

Employees' War Bonus	\$ 31,273.67	\$ 15,201.69
TOTAL	\$638,783.29	\$566,847.22
Refund from General Fund	22,671.98	
TOTAL	\$616,111.31	\$566,847.22

DEPARTMENT OF AGRICULTURE
CODE 1101

STATEMENT OF RECEIPTS

July 1, 1942-June 30, 1944

	1943-44	1942-43
Fertilizer Tax	\$348,422.40	\$323,163.86
Cotton Seed Meal	25,223.86	32,157.84
Feed	224,632.86	194,695.94
Seed Licenses	24,266.00	22,938.00
Condimental Feed	2,060.00	1,960.00
Serum	28,097.90	27,589.64
Costs	10,889.18	6,154.91
Legumes		
Linseed Oil	1,352.55	1,962.20
Bleached Flour	12,265.00	11,310.00
Bottling Plants	1,870.00	2,150.00
Ice Cream	1,700.00	2,240.00
Insecticides	2,860.00	2,180.00
Chick Labels	22.50	227.42
Test Farms	52,003.52	73,127.13
Bakeries	1,550.00	1,600.00
Chicken Tests	3,718.65	21,191.48
Seed Tags	7,083.91	7,156.82
Seed Tests		
Inspection Entomology	1,880.10	2,137.70
Oleomargarine	3,300.00	2,100.00
Rabies	1,116.60	756.00
Land Plaster Tags	2,208.41	1,905.98
Agricultural Lime Stamps	3,407.65	3,641.67
Fertilizer Registrations	3,493.00	4,057.50
Dynamometer		
Miscellaneous	187.13	602.74
Feed Registrations	2,887.50	3,270.00
Canned Dog Food Registrations	661.85	315.00
Dog Food Stamps	(38.70)	213.22
Lime Registrations	215.00	295.00
Land Plaster Registration	70.00	40.00
Livestock Market Permits	825.00	775.00
Hatchery Fees and Supplies	11,107.02	
Test Farm Imprest Cash	4,000.00	
 TOTAL	 \$783,338.89	 \$751,915.05
Balance July 1, 1943		\$536,376.41
Balance July 1, 1944		\$703,603.99

STATE WAREHOUSE SYSTEM
SPECIAL FUND—CODE 1801
FINANCIAL STATEMENT

STATEMENT OF DISBURSEMENTS

July 1, 1942-June 30, 1944

	1943-44	1942-43
Salary, Superintendent	\$ 3,800.00	\$ 3,750.00
Salaries and Wages, Staff	11,531.58	15,180.67
Supplies and Materials	138.27	227.93
Postage, Telephone, Telegraph and Express	908.52	1,097.91
Travel Expense	1,361.45	2,339.27
Printing and Binding	8,286.45	8,230.52
Motor Vehicle Operation		102.07
Repairs and Alterations	22.48	13.70
General Expense	167.00	175.00
Insurance and Bonding	371.25	381.25
Equipment	20.00	
Contribution to Retirement System	526.37	636.51
Employees' War Bonus	1,639.53	972.08
Workmen's Compensation		844.33
 TOTAL	 \$ 28,772.90	 \$ 33,951.24

STATE WAREHOUSE SYSTEM

STATEMENT OF RECEIPTS

July 1, 1942-June 30, 1944

	1943-44	1942-43
Interest on Bonds	\$ 14,847.86	\$ 14,211.25
Interest on Loans	13,025.76	9,022.64
Leases	240.00	270.00
Sale Warehouse Supplies	8,238.59	8,128.21
Sale Loose Cotton	299.40	441.75
Miscellaneous	7.02	1.10
 TOTAL	 \$ 36,658.63	 \$ 32,074.95
Treasurer's Cash, Supervision Account	\$ 54,669.57	\$ 46,805.93
Treasurer's Cash, Principal Fund	6,554.21	67,761.33
Total Investments and Loans at June 30, 1944	\$636,305.57	

BIENNIAL REPORT

COOPERATIVE INSPECTION SERVICE
SPECIAL FUND—CODE 1803

STATEMENT OF DISBURSEMENTS

July 1, 1942-June 30, 1944

	1943-44	1942-43
Salaries, U. S. Inspectors and Supervisors	\$ 50,127.68	\$ 39,954.73
Supplies and Materials	376.22	380.53
Postage, Telephone, Telegraph and Express	1,441.14	746.97
Travel Expense	18,228.01	5,999.24
Printing and Binding	98.43	143.54
Typing	2,017.65	1,156.22
Office Rent	302.95	92.00
General Expense	167.46	34.25
USDA Certificates	3,577.68	2,148.50
Equipment	28.20	
Contribution Retirement System	247.70	233.60
Employees' War Bonus	791.10	345.00
USDA Soybean Inspection		38.36
Sweet Potatoes purchased for resale	14,173.69	
TOTAL	\$ 91,577.91	\$ 51,272.94

COOPERATIVE INSPECTION SERVICE

STATEMENT OF RECEIPTS

July 1, 1942-June 30, 1944

	1943-44	1942-43
Strawberries	\$ 2,423.99	\$ 3,856.52
Potatoes, Cucumbers, Beans	67,587.72	13,134.82
Mixed Vegetables	4,453.81	5,512.59
Field Peas	32.94	19.04
Tomatoes	11.25	116.96
Cabbage	133.92	532.01
Corn	188.40	216.16
Cantaloupes	770.88	985.59
Peaches	100.33	5,589.18
Watermelons	955.50	1,052.00
Apples	250.51	538.09
Sweet Potatoes	552.29	666.86
Miscellaneous	158.37	184.01
Soybeans	30.00	222.75
Interest on Bonds	820.00	820.00
Egg Inspections	12,237.59	7,546.50
Peanut Inspections	258.50	126.50
Wheat Inspection	2.50	242.50
Sweet Potatoes purchased for resale	14,119.60	
TOTAL	\$105,088.10	\$ 41,362.08
Balance July 1, 1943		\$22,097.73
Balance July 1, 1944		\$35,607.92

SHEEP DISTRIBUTION PROJECT
SPECIAL FUND—CODE 3

STATEMENT OF DISBURSEMENTS

July 1, 1942-June 30, 1944

	1943-44	1942-43
Sheep Ewes Purchase	\$ 47,353.71	\$ 18,125.00
Ram Purchase	858.00	626.00
Freight and Trucking	2,004.52	1,773.46
Feed and Pasturage	1,689.72	77.56
Expenses of Rams	38.98	3.00
General Expense	93.80	202.47
Storage of Eggs for Public Schools	442.49	
 TOTAL	 \$ 52,481.22	 \$ 20,807.49

SHEEP DISTRIBUTION PROJECT

STATEMENT OF RECEIPTS

July 1, 1942-June 30, 1944

	1943-44	1942-43
Sale of Ewes	\$ 54,919.53	\$ 14,469.21
Sale of Rams	883.25	679.00
Miscellaneous Collections	23.56	
Transfer from Department of Agriculture		4,500.00
 TOTAL	 \$ 55,826.34	 \$ 19,648.21
Balance July 1, 1943		\$6,340.72
Balance July 1, 1944		\$9,685.84

N. C. STATE FAIR

SPECIAL FUND—CODE 20

FINANCIAL STATEMENT

STATEMENT OF DISBURSEMENTS

July 1, 1942-June 30, 1944

	1943-44	1942-43
Salaries and Wages	\$ 2,560.00	\$ 6,491.72
Supplies and Materials		6.24
Postage, Telephone, Telegraph and Express	38.56	85.61
Travel Expense		35.90
Printing and Binding		606.75
Motor Vehicle Operation	266.41	148.11
Light, Power and Water	88.71	49.49
Repairs and Alterations	503.20	5,593.65
General Expense	93.71	229.70
Equipment	70.29	240.00
Insurance and Bonding		2,907.50
Employees' War Bonus	180.00	90.00
 TOTAL	 \$ 3,800.88	 \$ 16,484.67

BIENNIAL REPORT

N. C. STATE FAIR
STATEMENT OF RECEIPTS
July 1, 1942-June 30, 1944

	1943-44	1942-43
Miscellaneous	\$ 14.35	\$ 79.61
Rental on Buildings	60.00	1,405.67
Interest on Bonds	770.00	770.00
Storage on Tobacco	6,139.19	7,591.31
Proceed Sale of Stock Shares		714.23
 TOTAL	 \$ 6,983.54	 \$ 10,560.82
Balance July 1, Invested State Bonds	24,816.99	24,816.99
Invested U. S. Treasury Certificates of Indebtedness	30,000.00	
Treasurers' Cash	5,903.84	32,721.18
 TOTAL	 \$ 60,720.83	 \$ 57,538.17

LAND PURCHASE AND DEVELOPMENT
SPECIAL FUND—CODE 21

STATEMENT OF DISBURSEMENTS
July 1, 1942-June 30, 1944

	1943-44
Five-Room House and Garage	\$ 3,500.00
Cattle and Work Stock Barn	254.40
Sheep Barn	472.06
Dairy Barn	
implements	900.00
Fencing	
General	350.60
Livestock	
Travel	
Repairs and Alterations	609.35
Land Purchase	24,000.00
 TOTAL	 \$ 30,086.41

LAND PURCHASE AND DEVELOPMENT
STATEMENT OF RECEIPTS
July 1, 1942-June 30, 1944

	1943-44	1942-43
Sale of Land	\$ 14,900.00	\$ 84,836.21
Balance July 1, 1943		\$84,836.21
Balance July 1, 1944		\$69,649.80

N. C. STATE MUSEUM
GENERAL FUND—CODE 6115

STATEMENT OF DISBURSEMENTS

July 1, 1942-June 30, 1944

	1943-44
Salaries and Wages	\$ 9,505.51
Salaries and Wages, Extra	600.00
Supplies and Materials	394.94
Postage, Telephone, Telegraph and Express	141.29
Travel Expense	22.24
Printing and Binding	36.46
General Expense	129.69
Equipment	225.16
Employees' War Bonus	1,030.50
TOTAL	\$ 12,085.79

N. C. STATE MUSEUM
STATEMENT OF RECEIPTS
July 1, 1942-June 30, 1944

	1943-44
Sale of Scrap	\$ 115.73

CREDIT UNION
GENERAL FUND—CODE 6113

STATEMENT OF DISBURSEMENTS
July 1, 1942-June 30, 1944

	1943-44	1942-43
Salaries and Wages	\$ 5,785.00	\$ 5,177.33
Supplies and Materials	30.35	43.25
Postage, Telephone, Telegraph	91.06	113.44
Travel Expense	2,288.88	1,844.62
Printing and Binding	100.37	4.63
Employees' War Bonus	620.00	266.50
TOTAL	\$ 8,915.66	\$ 7,449.77

CREDIT UNION
STATEMENT OF RECEIPTS
July 1, 1942-June 30, 1944

	1943-44	1942-43
Examination Fees	\$ 2,834.44	\$ 2,735.09
Transfer from Code 1101	2,500.00	2,500.00
TOTAL	\$ 5,334.44	\$ 5,235.09

BIENNIAL REPORT

JAPANESE BEETLE CONTROL

GENERAL FUND—CODE 6111

STATEMENT OF DISBURSEMENTS

July 1, 1942-June 30, 1944

	1943-44	1942-43
Salaries and Wages	\$ 2,819.85	\$ 4,139.55
Supplies and Materials	7,546.15	6,496.56
Travel Expense	154.35	507.19
TOTAL	\$ 10,520.35	\$ 11,143.30

BANG'S DISEASE

GENERAL FUND—CODE 6052

STATEMENT OF DISBURSEMENTS

July 1, 1942-June 30, 1944

	1943-44	1942-43
Indemnity Diseased Slaughtered Livestock	\$ 11,992.69	\$ 12,809.01

TUBERCULOSIS AND GLANDERS

GENERAL FUND—CODE 6051

STATEMENT OF DISBURSEMENTS

July 1, 1942-June 30, 1944

Indemnity Diseased Slaughtered Livestock	\$ 487.50	\$ 574.51
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WEIGHTS AND MEASURES

GENERAL FUND—CODE 321

STATEMENT OF DISBURSEMENTS

July 1, 1942-June 30, 1944

	1943-44	1942-43
Salary, Superintendent	\$ 3,300.00	\$ 3,000.00
Salaries, Staff	12,073.94	10,802.50
Supplies and Materials	150.33	425.25
Postage, Telephone, Telegraph and Express	207.07	290.49
Travel Expense	10,604.50	8,965.77
Printing and Binding	112.95	58.56
Motor Vehicle Operation	732.57	
Repairs and Alterations	31.90	
Equipment	801.43	245.19
Office and Standard Testing Apparatus		140.00
Employees' War Bonus	1,511.55	707.00
TOTAL	\$ 29,526.24	\$ 24,634.76

WEIGHTS AND MEASURES

STATEMENT OF RECEIPTS

July 1, 1942-June 30, 1944

	1943-44	1942-43
Public Weighmasters' Licenses	\$ 2,575.00	\$ 2,670.00
Desk Presser Seals	507.50	742.50
Miscellaneous		
TOTAL	\$ 3,082.50	\$ 3,412.50

MARKETS (GENERAL FUND)

CODE 6114

STATEMENT OF DISBURSEMENTS

July 1, 1942-June 30, 1944

	1943-44	1942-43
Transfer to Agriculture Fund	\$ 22,671.98	

WHITE-FRINGED BEETLE ERADICATION

GENERAL FUND—CODE 6112

STATEMENT OF DISBURSEMENTS

July 1, 1942-June 30, 1944

	1943-44
Salaries and Wages	\$ 2,182.32
Supplies and Materials	126.14
Travel Expense	
Equipment	1,162.70
TOTAL	\$ 3,471.16

HOG CHOLERA WORK

GENERAL FUND—CODE 6116

STATEMENT OF DISBURSEMENTS

July 1, 1942-June 30, 1944

	1943-44
Salaries and Wages	\$ 2,134.05
Supplies and Materials	6.72
Postage, Telephone, Telegraph and Express	
Travel Expense	1,124.58
Printing and Binding	354.44
General Expense	2.92
Employees' War Bonus	195.09
TOTAL	\$ 3,817.80

BIENNIAL REPORT

TAX RATE ON FEEDING STUFF

TAGS AND STAMPS

25c Per Ton

Tax Tag Denomination	Cost Per Tag		Price Per 1,000 Tags
100 lb.	\$.0125 (1 1/4c)	Packed 1,000 to Box	\$12.50
75 lb.	.09375 (15/16c)	Packed 1,000 to Box	9.38
50 lb.	.00625 (%c)	Packed 1,000 to Box	6.25
25 lb.	.003125 (5/16c)	Packed 1,000 to Box	3.13
Tax Stamps Denomination	Cost Per Stamp		Price Per 1,000 Stamps
100 lb.	\$.0125 (1 1/4c)	Bound 1,000 to Book	\$12.50
75 lb.	.09375 (15/16c)	Bound 1,000 to Book	9.38
50 lb.	.00625 (%c)	Bound 1,000 to Book	6.25
25 lb.	.003125 (5/16c)	Bound 1,000 to Book	3.13
10 lb.	.00125 (%c)	Bound 1,000 to Book	1.25

In placing your orders please state whether you want Stamps or Tags.

DIVISION OF CHEMISTRY

DR. E. W. CONSTABLE

The work of the Division of Chemistry involves in the main commercial fertilizers, fertilizer materials, commercial feeds, insecticides, fungicides, liming materials, land plasters, foods, drugs, cosmetics, and devices. The bearing of these on crops, plants, domestic animals, poultry, and finally on human beings is obvious.

The purpose of the work is to keep constant check on these products to see that they measure up to guarantees and established standards and that at all times they are safe for use and suitable for the purposes for which they are produced and sold. For this report the coverage of the biennium is presented as follows:

FERTILIZERS

All commercial fertilizers are analyzed for content of the major plant food elements, nitrogen, phosphates, and potash, also for acid-forming or neutralizing qualities. The number of samples worked during the biennium, the largest yet for a like period of time, were: Official samples, 10,949; fertilizers and fertilizer materials for farmers, 177; official liming material, liming materials with potash and landplaster, 163; and miscellaneous limes and landplasters, 90. Total: 11,379.

In addition to the elements already named, others—calcium, magnesium, sulphur and chlorine—are of importance. Some are necessary in plant nutrition. Some may be either beneficial or harmful. Knowledge of them is essential in good soil management and crop production. Analyses made for these additional elements were: Calcium oxide, 2,265; magnesium oxide, 4,500; sulphur, 1,844; and chlorine, 4,780.

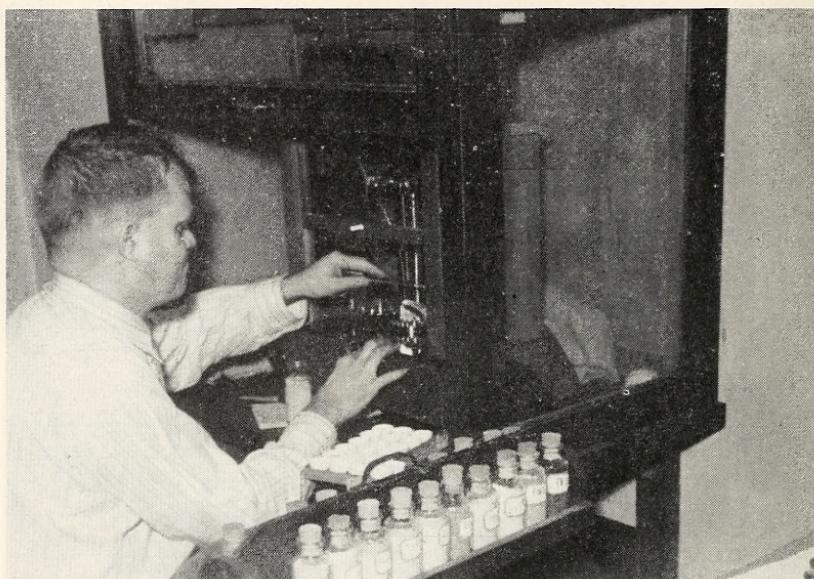
The analyses showed that in general, the products marketed in the State were of good quality and lived up to guarantees. In a small minority of exceptions, corrections were made.

Detailed reports of analyses were made with reasonable promptness to those concerned. Final full report of all analyses



DR. E. W. CONSTABLE

was made available to the public by publication in the Bulletin of the Department.



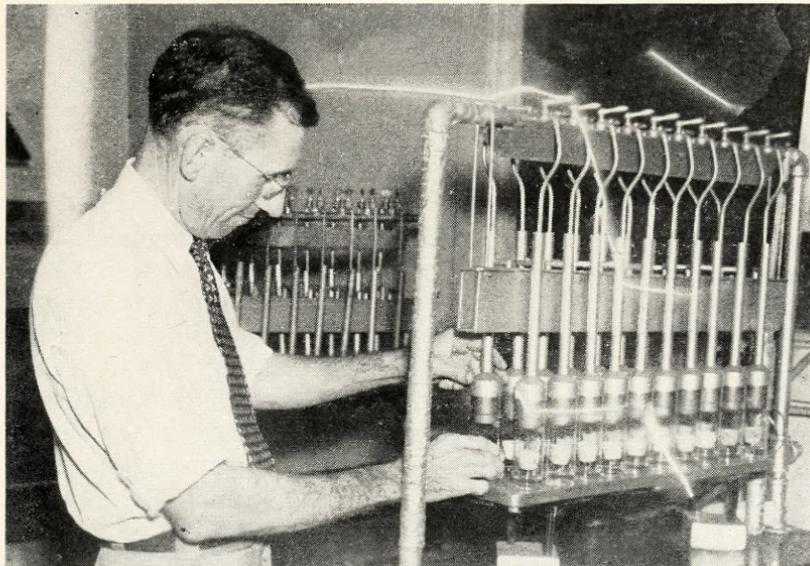
Sampling feeds for subsequent analysis.

COMMERCIAL FEEDS

Commercial feeds were analyzed chemically for protein, fat and crude fibre, and examined microscopically for the specific ingredients used in their composition. Additional analyses were necessary in some cases such as for urea, an ingredient that has been found permissible to a limited extent in some types of feeds, also for abnormal conditions which occur at times. Samples analyzed by the Feed Laboratory for the biennium were: Feeding stuffs, official samples, 3,100; unofficial and miscellaneous samples, 553. Total: 3,653.

The number of samples, greater by 542 than that of the previous biennium, is the largest turned out to date for a like period of time.

Results of analyses showed that feeds sold in the State were in the main of good quality and in compliance with guarantees. Cases of non-compliance with guarantees or standards were promptly referred to the Commissioner of Agriculture for proper action under the law.



A step in the determination of fat content.

Reports of analyses were made promptly to those concerned, and full seasonal report made available to the public by publication in *The Bulletin*.

INSECTICIDES AND FUNGICIDES

Insecticides and fungicides become increasingly indispensable in the production of crops. They are analyzed to check strength and compliance with standards and guarantees. Color is an important feature. The State law requires in the absence of a definitely characteristic color such as of Paris Green that an identifying color be added for reasons of safety.

A total of 160 official samples were analyzed—lead arsenate, 76; calcium arsenate, 44; magnesium arsenate, 12; Paris Green, 10; and Bordeaux Mixture, 18. On the whole, they were found satisfactory and in keeping with guarantees.

Food

The object of the work covered by the Food, Drug and Cosmetic Act, and the supplementary inspection laws and regulations for the proper maintenance and operation of bakeries, bottling plants, ice cream plants, and creamery and cheese factories, is to provide the consuming public with clean and whole-

some food products, properly labeled and sold under honest representation.

Wartime production and handling of food products have presented many abnormal problems. Though faced with multiple handicaps and forced to operate under the most adverse conditions, such as shortage of materials, loss of skilled and dependable employees, difficulty in procuring new machinery and replacements, many producers continued to manufacture high class products. But along with these there have been the careless and the negligent; those who made little or no effort to keep their plants in reasonably acceptable sanitary conditions or to put out products fit for human consumption. There have been numbers of exploiters who have sought to capitalize on emergency conditions to make profits fraudulently at the expense of consumers. To curb this, as well as to prevent insanitary conditions, it has been necessary to maintain the utmost vigilance over the operation of food processing plants and places where foods and food products were handled, stored, or offered for sale. Throughout the biennium emphasis was placed on the sanitary production and handling of food products originating within the State, though with no slackening of attention to those from outside. In the latter part of this two-year period it became evident that a great many substitutes were appearing on the market, the sale of which was in violation of the food law, and that the consuming public was being defrauded in the purchase of these substitutes. While not relaxing on features of sanitation, equally great effort has been made to clear the markets of these economic cheats. The work along these lines is by no means complete, but substantial progress has been made and the work is being continued.

In the enforcement of the food and sanitary inspection laws, it has been the policy of the Department to cooperate in an advisory capacity with manufacturers and dealers, thus aiding them to understand and meet requirements. Following each inspection the attention of dealers or persons in charge of the plants was called to defects that were found and such suggestions and recommendations were made as deemed helpful in bringing the plant into proper condition. In most instances these suggestions and recommendations were willingly carried out, but in some instances notices and warnings failed to bring about the necessary correction. In the latter instances the Department was forced to procedures leading to court action.

A comprehensive scoring system has been adopted by the Commissioner and the Board of Agriculture for bakeries, bottling plants, and ice cream plants. If the scoring of a plant or establishment fell below a level indicating satisfactory conditions, warning and a reasonable time was given for correction. If prompt correction was not made, an official closing order was served, requiring closure of the plant, to remain closed until satisfactory conditions were established, reinspection made by the Department and permission to reopen given. In instances of repetition or very bad conditions, closing orders were promptly served, provided operators did not voluntarily close. Court action was taken where circumstances so indicated. Twenty-three places were closed and eleven indictments were made for failure to comply with the requirements of the State food law and the supplementary sanitary inspection laws. All places were permitted to reopen for business as soon as they were cleaned and put into a sanitary condition necessary for the production of clean and wholesome foods.

Special attention was given to canneries putting up vegetables, fruits, fish and fish roe; pickle plants; candy factories; grist and flour mills; places where sausage and other meat products were made and handled; and places where mayonnaise and salad dressings were prepared. The following sanitary inspections were made: Bakeries, 1,006; bottling plants, 1,128; ice cream plants, creameries, cheese factories, etc., 1,098; and stores and other places manufacturing and handling food products, 940. Total: 4,172.

SPOILAGE, FILTH AND OTHER FORMS OF CONTAMINATION INCLUDING INSECT INFESTATION

In connection with the inspection of places manufacturing, handling and storing food products, many articles were found that were unfit for human consumption due to contamination with filth or decomposition. It is not practicable to mention all articles embargoed or destroyed for these reasons, but to give an idea of the scope of the work covered, the following are listed: 39,863 lbs. flour; 1,100 lbs. corn flakes; 72 cans saur kraut; 4,200 lbs. sugar; 1,938 boxes of cookies; 137 boxes of cakes; 200 lbs. cake filling icing; 242 lbs. candy; 1 barrel cake mix; 76 gallons of ice cream; 288 cans of flaked fish; 67 cans pineapple; 721 cans of peaches; 50 lbs. of bacon; 300 lbs. of kidneys;

10 turkeys; 1 barrel of tripe; 100 lbs. pork trimmings; 893 pints of peanut butter; 24 lbs. of balogna; 15,000 herrings; 288 cans herring roe; 5,971 lbs. beef, veal and weiners; 1,000 lbs. meat; 592 lbs. pork skins; 1,428 quarts sweet pickles; 35 cases pickles; and 136 lbs. beef trimmings. Where possible, products were salvaged for animal feed or other useful purposes.

ADULTERATION AND MISBRANDING, INCORRECT OR INSUFFICIENT LABELING, AND ECONOMIC CHEATS

In a period of wartime shortages, economic cheats assume added importance in the welfare of the consumer. Current shortages and price ceilings have encouraged the practices of adulteration and misbranding. A variety of substitutes, imitations, and diluents have appeared, some with labeling either false or so insidiously devised that all but the most observant consumers are grossly deceived. Such cheats become more serious where the supply of commodities is limited and the consumer is obliged to curtail his food purchases. Violations of this kind not only effect the pocketbook but may actually impair the health of the consumer through reduced nutritional values. Such violations are not countenanced by the State Food, Drug and Cosmetic Act. To mention two adulterations of this class: due to the shortage and rationing of sugar, certain manufacturers substituted saccharin for sugar in their products; also due to the shortage and rationing of fats and oils a few manufacturers substituted mineral oil in place of edible food oils. Neither saccharin nor mineral oil has any food value. Food experts and physicians in some instances hold their indiscriminate use as foods to be a liability to health.

Many worthless substitutes for coffee and cocoa appeared on the market as the supply of these articles diminished. A large amount of salad dressing with low oil content and containing an excessive amount of boiled starch rendering it questionable in food value, also appeared. Much of this latter product had separated, making it unattractive in appearance. It suffered a high rate of spoilage, perhaps due to low quality.

Abnormal conditions have effected labeling also. The purpose of labeling is to give purchasers full and accurate information on the product being bought. Requirements are that there shall be given the name of the product, net contents of its container, and the name and address of the manufacturer, jobber,

or distributor. If the product is one for which an official definition or standard has not been set up, the label must carry also a list of ingredients in descending order according to predominance. A total of 3,328 packages and containers of foods and beverages were examined for labeling. Of that number, 430 were found either incorrectly labeled or to carry insufficient information. In a few occurrences no labels were present. In such instances, instructions for proper labeling were given and if parties offering the products for sale could make corrections, this was allowed. In some instances permission was granted to return goods to the manufacturer for proper labeling. In cases where misbranding could not be corrected by any form of relabeling the goods were either destroyed or denatured and permitted to be sold or otherwise disposed of for purposes other than for human consumption.

Below are listed some of the food products embargoed because they were offered for sale in violation of the State Food, Drug and Cosmetic Act, for reasons involving adulteration, incorrect labeling, and economic cheats: 29,000 lbs. of cocoa, packed in 40 lb. bags; 5,600 lbs. of cocoa; 960 lbs. of cocoa substitutes; 941 cases of cocoa substitutes; 361 lbs. of butter; 253 gallons of vinegar; 25 jars of pepper relish; 8 5-lb. boxes of candy; 2,796 pkgs. of candy; 48 pieces of chewing taffy; 56 lbs. of citrus confections; 2 boxes of tropical sweets; 31 4-lb. fruit cakes; 3,986 cans of beans and pork; 3,069 lbs. of Covee, a substitute for coffee; 107 lbs. of Chili Con Carne; 96 8-oz. cans of baking powders; 25 bottles of grape drink; 136 cakes; 165 5-lb. buckets of honey; 1,121 packages of cakes; and 1,691 gallons of salad dressing, mayonnaise and sandwich spread.

As some of these products were involved in interstate shipments, seizures were made in cooperation with the Federal Food and Drug Administration and some of the seized articles were released to the Federal Department for disposition.

WATER AND FIRE DAMAGED GOODS

Several large stocks of groceries, damaged by fire and water incident to fire, were inspected by representatives of the Department, in some instances in cooperation with city and Federal food inspectors. Some of the products too badly damaged for any use were destroyed; others less damaged were salvaged for animal feed or other useful purposes. In instances involving canned goods with exterior damage only, as from smoke and

water, where use as human food was considered safe, their sale as such was permitted. In all instances the inspectors encouraged the salvage of spoiled or damaged products for whatever purpose they could best be used. Oils and fats were routed into Federal fat salvage channels. A partial list of fire and water damaged goods follows: 4,014 lbs. of lard and vegetable oils; 400 lbs. of beans and peas; 200 lbs. of nuts; 204 cans of potted meats; 216 packages of tea; 36 lbs. of coffee; 100 lbs. of shredded wheat; 48 lbs. of black pepper; 51 packages of corn flakes; 200 lbs. of sugar; 20 cans of sausage; 20 cans of mackerel; 25 jars peanut butter; 50 bottles of syrup; 92 cans of vegetables; 208 cans of fruits; 745 lbs. of coffee substitute; 460 lbs. of coffee; 355 lbs. of cocoa and cocoa substitute; 225 lbs. of prunes; 200 lbs. of pickling spices; 644 lbs. of rice; 11,838 lbs. of flour; 12 cans of tomato juice; 64 packages of oat meal; 50 lbs. of corn meal; 65 packages of beans; 75 packages of popcorn; 680 ozs. of black pepper; 1 case of medicated salt; 4 cases of salt; 2,525 lbs. of salt; 250 packages of puffed wheat; 500 packages of oat meal; 500 packages of soda crackers; 500 lbs. of rice; and 1,250 lbs. of miscellaneous groceries.

A total of 3,885 pounds of hams and 40,000 pounds of corn were damaged in a railroad accident. One carload of sugar was damaged in transit. These shipments were inspected and that part unfit for human food was salvaged for other useful purposes.

ANALYSES—OFFICIAL

All violations of the food and drug laws fall largely into the two categories, adulteration and misbranding. Adulteration covers any foreign or non-permissible substances that may occur in foods, such as filth, vermin, insects and insect fragments, contamination of all kinds, miscellaneous foreign objects and substances, products of decomposition whether added or later developing, or substances not in compliance with standards, either added, substituted or omitted. Misbranding covers failures to give basic information required by law, inaccurate or misleading information, failure to give pertinent information, or giving this in devious or obscure ways. Some types of adulteration and misbranding are apparent from field observation. A large variety of others are not. The purpose of analyses is to disclose the latter.

A total of 650 samples were collected throughout the State during the biennium for laboratory inspection and analyses. Careful selection was exercised in this. They were carried through appropriate analyses, chemical, microscopical, physical, and optical. Practically all that failed in compliance with the law and regulations can be classified as follows:

- (1) Failure to meet definitions and standards
- (2) Incorrect or insufficient labeling
- (3) Presence of filth
- (4) Presence of preservatives
- (5) Addition of coloring matter
- (6) Economic cheats
 - (a) Products worthless in part or in whole
 - (b) Slack fill of containers
 - (c) Short weight

Where results of analyses showed failure in compliance, reports were sent to manufacturers, dealers, or others concerned. If defections were minor in nature, reasonable time was allowed for correction, or the products were withdrawn from sale until correction was made. In instances of gross or repeated violation the cases were cited for court action, the offender, however, being extended the privilege of hearing prior to such action.

ANALYSES—UNOFFICIAL

A large number of samples not collected officially by the Department came into the laboratory. These were analyzed according to the merits of the individual cases and reports sent to those concerned. A number of such cases resulted in court action in which the Department was called on for testimony.

A total of 390 such samples were received, consisting largely of foods and beverages for human consumption, animal and poultry feeds that were suspected of containing poisons or other harmful foreign substances likely to cause sickness and perhaps death; viscera and other specimens from the bodies of animals suspected of having been poisoned; water from sources of supply used in boilers or for other commercial purposes; and many miscellaneous samples the examination of which would serve worthwhile purposes. These samples were sent in variously by city and county officials, physicians, farmers, merchants and other citizens of the State. This work was done in keeping with the policy of the Department to render whatever useful service

possible to citizens of the State in so far as circumstances permit and justify. Other samples came into the laboratory, the analysis of which obviously would serve only to satisfy curiosity, disclose formulae of others, or which could serve no worthwhile purpose. Such samples were not worked since the time and cost involved would not have been justified.

RE-USE OF BOTTLE CAPS

Due to war demands for metals and cork, bottlers of soft drinks were faced with a shortage of bottle caps. In an effort to aid in offsetting this difficulty, the Department, after extended consideration and investigation, and in cooperation with representatives of the North Carolina Bottlers Association, adopted regulations for the sanitary treatment and recovery of old caps for re-use. This was an emergency measure to apply for the duration only and also is subject to amendment or revocation at any time the Department deems such action desirable or necessary. The bottlers have been very cooperative in carrying out these measures. Only a very limited amount of correction has been called for.

DRUGS

Work under that part of the Food, Drug and Cosmetic Act dealing with drugs has been only minor. This has been due to lack of funds, personnel, and laboratory accommodations.

There has been, however, activity of an emergency nature in this field. The Castoria case which initiated nation-wide activity and became nation-wide news originated in this Department as a result of complaints from two rather widely separated North Carolina towns, to the effect that babies had suffered serious illness as a result of taking this medicine. Later, a small quantity of this Castoria was found in the State. It was withdrawn from sale and returned to the manufacturers. Apparently it had been missed when the original questionable lot had been called in. Thirty-seven boxes of gonorrhea paste, a worthless product improperly labeled, was withdrawn from sale and destroyed. One hundred and twelve bottles of vitamin tablets, improperly labeled and short of the content claimed, were withdrawn from sale.

There obviously is a great need for a fuller and more active program under that part of the law dealing with the inspection

and control of drugs, devices and cosmetics sold in the State. Such a program, however, must await the provision of funds. It is hoped that means for doing this can be found at an early date.

OLEOMARGARINE

Work on oleomargarine has been limited also, due to the shortage of personnel both in the laboratory and field. The normal compliment of four chemists in food work has been reduced to one as a result of the war situation and other conditions. Chemists competent in this work are not available at State salary levels.

The work that has been done indicates that in general the product sold in this State has been in compliance with the law. The placards required where it is served to the public have been in evidence generally. An exception to the above was several large lots of colored oleomargarine which were offered for sale in the Western part of the State. Apparently this had been done in the open and in ignorance of the law. It was withdrawn from sale and shipped to states where its sale was legal.

LINSEED OIL

Wartime demands have for all practicable purposes removed linseed oil from the markets, and only compound linseed oil, imitation linseed oil, and substitutes are now being sold.

The Linseed Oil Inspection Law provides for the sale of these products, requiring however, that they be properly labeled and sold for what they are. From the work done, it appears that manufacturers and dealers have been complying satisfactorily with the law covering these oils.

LABORATORIES AND EQUIPMENT

Because of emergency conditions, laboratories and equipment have suffered depreciation. Upkeep and repairs have been limited to bare necessity. Undesirable conditions exist, which are due to obsolescence and want of modernization. In some instances these are contrary to the practices of present-day industrial hygiene. Correction of the situation will be an asset to both the work and personnel. It is hoped that such correction can be effected in the early future.



D. R. GRAHAM

CREDIT UNION DIVISION

D. R. GRAHAM

During the two years ending June 30, 1944, credit unions experienced the most difficult period since our Credit Union Law was enacted in 1915. Although the savings of members increased over \$400,000 during the period, loans decreased slightly under \$250,000. The decrease in loans was largely due to the disappearance of durable goods from the market, together with the rigid restrictions imposed upon lending agencies by the Federal government.

The increase in assets and the decrease in loans naturally caused a considerable increase in cash on hand and in banks. Practically all of this increase has been invested in war bonds, credit unions now owning \$627,000 worth of government bonds. As of June 30, 1944, 24.8% of the total assets of our credit unions was invested in war bonds. I am sure that this record has not been exceeded, and I do not believe that it has been equalled by any other type of lending agency in the State.

Although 20 new credit unions were organized, 24 were liquidated, or suspended operations resulting in a net loss of 4 credit unions. New credit unions organized are as follows:

Urban Community—1 white, 6 negro
Rural Community—7 negro
Government Employees—3 white
Printing & Binding—1 white
Paper Manufacturing—1 white
Newspapers—1 white

Membership during the period showed a net decrease of 2,088. This decrease was due largely to credit union members entering the armed services and accepting employment in war plants in other states.

All credit unions have been examined at least twice during the biennium, and the few irregularities found have been corrected.

Dividends have been reduced throughout the State to a maximum of 3%, and in some cases it has been necessary to declare

no dividend whatever. This situation was brought about by reason of the fact that practically all of credit union income is derived from interest on loans to members, and since loans have shown a sharp decrease while assets increased considerably, credit unions have found it difficult to pay operating expenses and maintain a dividend of as much as 3%.

We are putting forth every effort to keep the existing credit unions going and to organize new credit unions, since it is the opinion of credit union leaders generally that when the war is over, unless there is some place where wage-earners may borrow at a reasonable rate of interest, the result will be that countless numbers will cash in war bonds which might otherwise be held. Our credit unions are encouraging their members to hold war bonds until maturity and to meet emergency needs in the meantime by borrowing from a credit union.

The experimental work which we have been carrying on among rural negro groups is working out splendidly. Two of these groups now have total assets in excess of \$25,000 each, and several of the others are experiencing remarkable growth. Our program among negro rural groups is attracting nationwide attention, and plans are now being formulated to conduct



The board of directors of the Light of Tyrrell Credit Union, the outstanding negro credit union in the United States.

similar programs in other states throughout the country. The Light of Tyrrell Credit Union, Columbia, N. C., is one of our outstanding negro groups. It is considered by national leaders to be the finest credit union of its type in the world.

After the end of the war we anticipate far greater credit union expansion than we have ever experienced heretofore.

	June 30, 1942	June 30, 1944
Active credit unions	150	146
Total members	27,094	25,006
Total assets	\$2,105,582.29	\$2,527,915.99

NORTH CAROLINA CREDIT UNIONS

CONSOLIDATED BALANCE SHEET

June 30, 1944

ASSETS

Cash on Hand and in Banks	\$ 599,539.57
Loans	1,143,290.38
U. S. Government Bonds	627,172.67
Other Assets	157,913.37
TOTAL ASSETS	\$2,527,915.99

LIABILITIES

Shares	\$2,029,820.83
Deposits	278,559.27
Reserve Fund	119,157.15
Other Liabilities	25,992.59
Undivided Earnings	74,386.15
TOTAL LIABILITIES & CAPITAL	\$2,527,915.99

DAIRY DIVISION

C. W. PEGRAM

Dairymen have made a distinct contribution to the war effort during the past two years despite the handicaps and hardships such as labor problems, feed shortages and wartime restrictions. According to the 1943 preliminary estimate of the State-Federal Crop Reporting Service North Carolina dairy farmers received \$21,565,000 in cash from the sale of dairy products, and the gross farm income from these products was \$55,825,000. The outlook for 1944 indicates a greater increase in value. Whole milk sold to plants in 1943 was 288,891,610 pounds, as compared with 145,883,458 pounds in 1940, an increase of 98%. While these are record figures, it does not mean necessarily new production because some conversion such as farm butter and cream to manufactured milk has occurred.

The Dairy division has supported dairy farmers in their "all out" production by an active Babcock test control program. Butter fat tests are variable from day to day, month to month, and season to season. The tests from individual cows vary daily similarly to production. Variations are also caused in the handling on the farm and at the plant. Unusual test complaints were received during the summer months following the drought, and an investigation showed in most cases that sampling and testing were done accurately. Turner of the Missouri Experiment Station has found that temperature is a factor to be considered during the seasons of the year. His experimental work showed that when other conditions were the same, the lower the environmental temperature, the higher the percentage of fat in the cow's milk. There was an increase of almost 0.2 per cent in the fat for a decrease of 10 degrees Fah. in the temperature between the limits of 30 to 70 degrees F.

In carrying out the provisions of the Babcock test law it has been our object to prevent undue variations at the plants due to improper sampling or careless testing. Approximately 1,200 investigations were made at 75 plants and receiving sta-



C. W. PEGRAM

Good practices like the above are necessary for the development of agriculture in North Carolina.





Women are doing their bit too. Over 30 women in North Carolina are licensed to do Babcock milk test work.

tions, with over 22,000 check tests completed. Contrary to general opinion, milk testing is not simple, as it involves a proper procedure from the sampling to the reading of the test.

The following steps are important and if not followed may cause variations at plants:

Sampling:

It should be representative of the producers' deliveries for the test period.

Samples should be preserved properly and should be stored in dark cool storage.

Testing:

Milk should be heated to 108 degrees F. in the sample bottles. All of the fat should be rubbed from the sides of the bottles and the milk should be agitated while being weighed out.

Milk and acid should be cooled to the temperature of 60-70 degrees F. and should be properly mixed.

The centrifuge should have a heater and it should be run at the proper speed. Soft water should be used where hard water is found. A hot water bath with a temperature of 130-140 F. should be used before the tests are read. Dividers for reading should be tight and the points should be sharp and the same length. All of these details are important and the use of unreliable methods will cause variations. The failure to follow the proper procedure will result in lower tests. Due to the constant turnover of samplers and testers the importance of test supervision has been of unusual importance during wartime. The lack of knowledge of test work may cause unintentional violation of the test law.

Variations in tests may be due to conditions on the farm and it may be worthwhile to mention some of these factors:

Breed—The breed of the cow is the most important single factor.

Feed—Contrary to general opinion, fat percentage cannot be permanently changed by the feed or by the method of feeding.

Condition of the cow at calving—It is a good practice to have the cows in good condition at calving time.

Periods between milking—Milking schedules should be followed closely.

Frequency of milking—There is a slight tendency for tests to increase when a cow is milked three to four times daily.

Age and health of the cow—Fat tests are usually constant until about the sixth lactation period, after which there is a decrease.

Dog?

Excitement and drugs—Frightening by dogs or by strangers may cause a cow to hold up a part of her milk which results in lowered content.

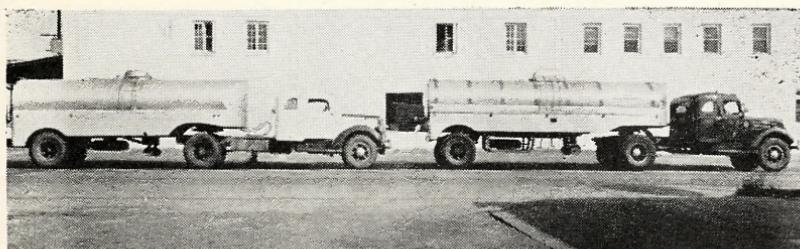
Season of the year—Tests are lowest in the months of June to August and they are highest from October to December. Low tests in the summer months are largely due to:

1. A large proportion of cows freshen in the spring.
2. The humidity and temperature, which was discussed previously.
3. The last milk drawn, which is known as "strippings," is always richer than the first that is drawn. Failure to strip cows has no doubt been practiced considerably during this period of present labor shortage.

Family milk and cream supply—Some producers take cream off the milk for family use. This practice will affect tests materially and it should not be used if the dairyman wishes to reduce test variations.

Size of the herd—The test of an individual cow or a small herd will vary more than the test of a large herd.

The division licenses 50 samplers and 90 testers annually and constantly supervises their work. Approximately 250 special investigations were made during the biennial period. This service is important for the building of a great dairy industry, with the aim of first getting accurate work done in regard to



Tank trucks used in transporting milk from receiving stations to processing plants.

sampling and testing and then to establish confidence between the producers and the buying plants.

Buying plants and stations supervised, 75; plant investigations, 1,194; butterfat check tests, 15,242; butterfat tests supervised, 2,718; and sample tests, 4,436. Total: 22,396.

Testers and samplers licensed annually, 140; testers trained, 44; tests found incorrect (adjustments made), 694; test card notices mailed, 6,980; testing equipment condemned, 3; special test investigations, 250; milk and cream scales checked (in co-operation with Bureau of Weights & Measures), 57; scales condemned for repairs, 17; and weights confiscated, 4.

MILK AUDIT LAW

(Chapter 162 Public Laws of N. C. 1940)

Three years' data as carried in this report furnish a complete picture of Grade A milk production and consumption. Monthly reports of milk purchases and sales report by distributors furnish producers an accounting of the marketing of their product. It is significant to note that no surplus milk has existed since June, 1942.

This legislation is adjudged to be one of the best contributions made to agriculture in recent years. It has caused nationwide interest for its completeness and economy of operation. Only one auditor is required to assimilate the reports and to check plant records. Approximately 1,300 reports were received and verified during the biennium and 175 visits were made to plants regarding same.

As dairying develops in the State, the need for this activity will be increased and its promulgation will be of great value toward stabilization in the dairy industry, which is desirable for both producer and distributor.

DAIRY PRODUCTS STATISTICS LAW

(Chapter 327 Public Laws of North Carolina 1939)

Another yardstick used in measuring for dairy developments is the results from the semi-annual reports covering dairy products. This is a cooperating service carried on by the Federal Crop Reporting Service, dairy plants, and the Dairy division. This information is of value not only to the dairy industry but to the public and is used in developing farm programs by State and Federal agencies. It is worthwhile to note the increased

An Aerial View of Klondike Farm.



production of ice cream. Part of this expansion is due to the purchasing of ice cream for military personnel. The trend of creamery butter is toward lower production. This is partly due to the marketing of whole milk rather than farm separated cream.

	1939	1940	1941	1942	1943
Whole Milk Purchased as reported by plants	100,955,354	145,883,458	205,047,914	241,415,917	288,891,610
Creamery Butter Made	2,366,000	2,357,000	2,315,603	2,215,755	1,678,288
Total Ice Cream Made (gals.)	3,843,000	4,219,000	6,294,000	8,862,000	9,437,000

Purchases of Grade A milk from producers as recorded by milk distributors:

POUNDS

1941	Total Purchases	Class I	%	Special Price Army Camps, etc.		Surplus or Low Price Milk	%
				%	%		
June	8,911,478	7,569,985	84.95	502,050	5.63	839,443	9.42
July	9,203,721	7,846,076	85.25	398,663	4.33	958,982	10.42
August	10,033,040	8,726,521	86.98	500,806	4.99	805,713	8.03
September	9,270,392	8,482,116	91.50	545,860	5.89	242,416	2.61
October	8,629,928	7,874,190	91.24	614,072	7.12	141,666	1.64
November	7,968,268	7,378,150	92.59	349,286	4.38	240,832	3.03
December	8,556,820	7,899,061	92.31	486,939	5.69	170,820	2.00
Total	62,573,647	55,776,099					

1942

January	8,534,982	7,969,215	93.37	444,750	5.21	121,017	1.42
February	8,546,994	7,955,953	93.08	515,289	6.03	75,752	.89
March	9,762,352	9,183,780	94.07	544,630	5.58	33,942	.35
April	10,140,344	9,653,058	95.19	468,302	4.57	23,984	.24
May	10,738,500	10,359,948	96.47	373,615	3.48	4,937	.05
June	10,769,383	10,377,652	96.36	369,062	3.43	22,669	.21
July	11,137,991	10,841,163	97.33	296,828	2.67	—0	—0
August	11,869,217	11,732,557	98.85	136,660	1.15	—0	—0
September	10,737,970	10,680,016	99.46	57,954	.54	—0	—0
October	9,768,824	9,697,345	99.26	71,479	.74	—0	—0
November	9,035,595	8,929,849	98.83	105,746	1.17	—0	—0
December	9,540,537	9,428,057	98.82	112,480	1.18	—0	—0
Total	120,582,689	116,808,593					

1943

January	9,683,470	9,608,382	99.22	75,088	.78	—0	—0
February	9,286,236	9,227,261	99.36	58,975	.64	—0	—0
March	10,552,173	10,552,173	100.00	—0	—0	—0	—0
April	11,087,263	11,087,269	100.00	—0	—0	—0	—0
May	12,654,576	12,654,576	100.00	—0	—0	—0	—0
June	12,415,915	12,415,915	100.00	—0	—0	—0	—0
July	12,982,437	12,982,437	100.00	—0	—0	—0	—0
August	13,212,978	13,212,978	100.00	—0	—0	—0	—0
September	11,756,294	11,756,294	100.00	—0	—0	—0	—0
October	10,723,836	10,723,836	100.00	—0	—0	—0	—0
November	9,918,979	9,918,979	100.00	—0	—0	—0	—0
December	10,546,133	10,546,133	100.00	—0	—0	—0	—0
Total	134,820,296	134,686,233					

1944

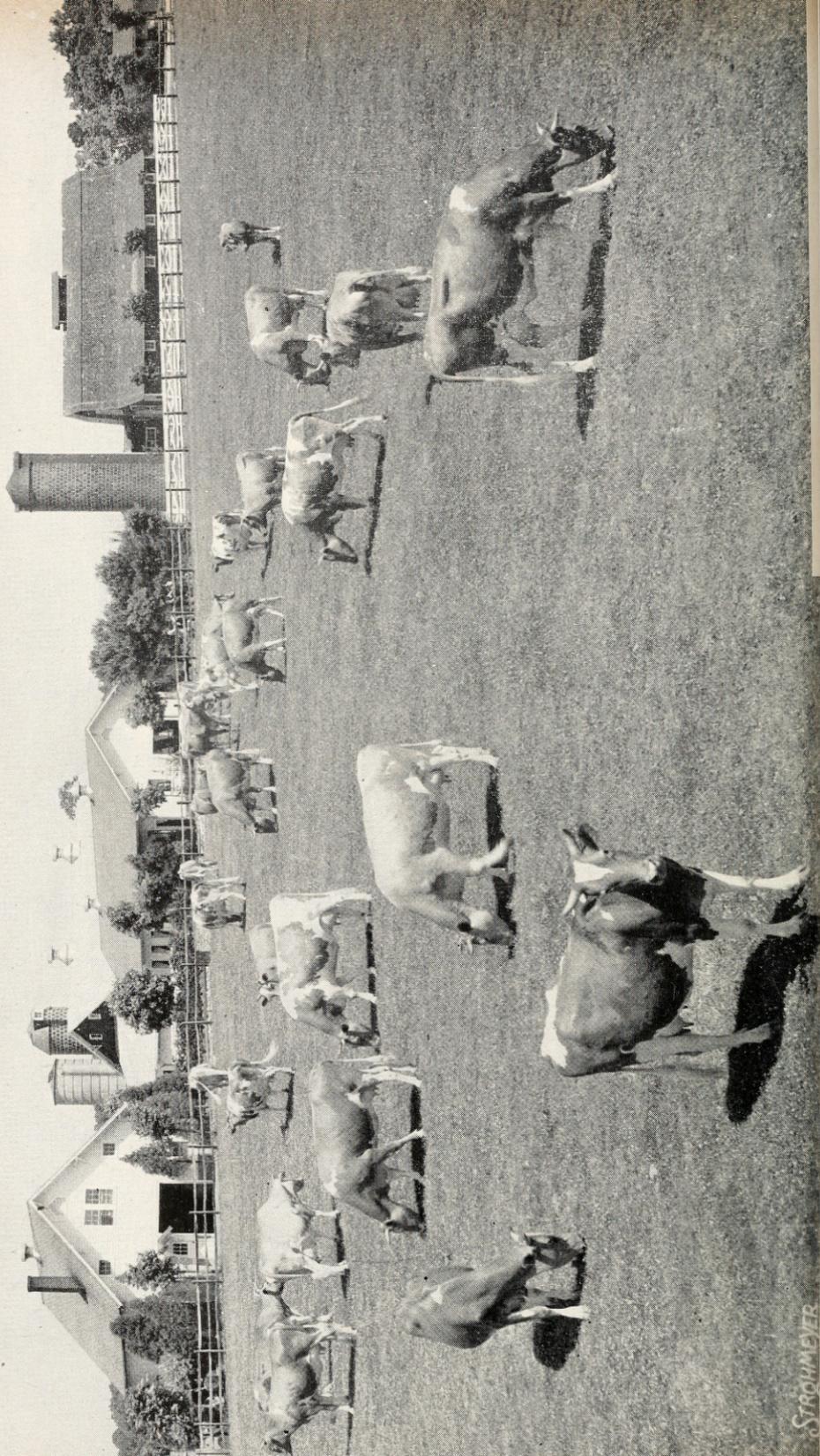
January	10,914,858	10,914,858	100.00	—0	—0	—0	—0
February	10,595,102	10,595,102	100.00	—0	—0	—0	—0
March	11,534,558	11,534,558	100.00	—0	—0	—0	—0
April	12,257,024	12,257,024	100.00	—0	—0	—0	—0
May	14,015,902	14,015,902	100.00	—0	—0	—0	—0
June	13,668,464	13,668,464	100.00	—0	—0	—0	—0

Total 72,985,908 72,985,908

Production of manufacturing milk has grown as well as Grade A. The figures listed below show this growth.

Manufacturing milk purchased from producers as reported by milk distributors:

1941	Pounds
June	3,968,249
July	4,606,200
August	6,032,040
September	4,786,898
October	4,332,358
November	3,838,549
December	3,581,082
TOTAL	31,145,376
1942	
January	3,460,483
February	3,211,413
March	3,711,537
April	4,048,008
May	5,796,282
June	6,133,712
July	6,709,153
August	8,434,874
September	7,946,890
October	6,280,155
November	6,176,341
December	6,379,880
TOTAL	68,288,728
1943	
January	7,231,697
February	6,517,347
March	7,935,786
April	6,341,905
May	8,227,647
June	9,286,568
July	10,074,446
August	11,125,323
September	10,050,114
October	8,325,827
November	7,496,083
December	7,182,173
TOTAL	99,794,916
1944	
January	6,853,814
February	6,292,813
March	6,817,524
April	6,645,802
May	8,996,950
June	10,308,666
TOTAL	45,915,569



STROHMEYER

DIVISION OF ENTOMOLOGY

C. H. BRANNON

This division is charged with the responsibility of administering the North Carolina plant pest laws and regulations. It also administers the North Carolina Bee Disease Law. The division of Entomology also cooperates with the U. S. Bureau of Entomology and Plant Quarantine in various projects, the most active of which are Japanese Beetle control and White-Fringed Beetle control.

The division has probably the most complete insect collection of any Southern State. Insect identification, filing of insect records, and care of the valuable collection is an important phase of the division's work.

NURSERY INSPECTION

The annual inspection of all nurseries in the State has always been one of the most important projects of the division. Nurseries which successfully pass inspection are issued a certificate which is valid for one year. This work, carefully carried out by J. A. Harris and Dr. D. L. Wray, occupies most of their time during July, August, and part of September of each year. The nurseries of the State have always heartily cooperated with the division and the citizens of this and other states are guaranteed clean stock. Our nursery inspection service is recognized as one of the best in the United States and the North Carolina nursery certificate is accepted by the Federal government and all states. North Carolina has approximately 225 certified nurseries.

The nursery inspection fees are as follows:

3 acres or less	\$ 5.00
4 to 10 acres	7.50
11 to 15 acres	10.00
16 acres	12.50
Each additional acre	.10

NURSERY DEALER CERTIFICATE

Dealers in nursery stock are required to pay an annual fee of \$10.00. This applies to individuals or stores. We have approximately fifty such dealers in the State.



C. H. BRANNON

PLANT SHIPPING PERMIT

Collectors of native plants, including boxwood, are required to pay an annual fee of \$10.00. There are approximately twenty such dealers in the State.

BOND REQUIREMENT

A bond of \$1,000 is required of all who promise (orally or written) later attention to nursery stock sold in North Carolina.

APIARY INSPECTION

The following report was submitted by the State Apiary Inspector, P. G. Craddock, who is engaged in enforcing bee disease laws and regulations which give protection to the bee-keepers of the State.

From July 1, 1942, to June 30, 1943, 12,675 colonies of bees were inspected. Of these, 36 colonies were found infected with American Foulbrood.

From July 1, 1943, to June 30, 1944, 10,207 colonies of bees were inspected and 49 were found infected with American Foulbrood.

Considerable European Foulbrood has been found in the eastern part of the State and some in the Piedmont and mountain areas. No quarantine regulations have been established



A well kept apiary.

on this disease, but considerable time has been spent instructing beekeepers how to control it.

There has been considerable expansion in the beekeeping industry in the State during the past biennium. This has been primarily due to higher prices for honey and beeswax since the war began, and to the desire of many people to produce their own "sweets" while sugar is scarce. Most of the expansion has been among sideline beekeepers and many beginners have entered the field. Shortages of labor and equipment have tended to prevent rapid expansion in commercial apiaries.

The rapid expansion in sideline beekeeping and the many beginners have added greatly to the duties and problems of the apiary inspector. Few of these beekeepers are familiar with bee diseases and know nothing about how to control them. Many of the new beekeepers live in cities and towns where some disease was already present, and there has been a rapid increase in the amount of disease in some of these cities and towns.

The greatest problems from a disease control standpoint are probably yet to come. After the war when honey prices drop and sugar is again plentiful many of these bees will be abandoned by their owners, will become infected with disease, and will be a constant source of infection for apiaries in the neighborhood. Much of the equipment will be sold or given away after the bees have died and this will spread disease over an even wider area.

There has been a large increase in the number of colonies of bees moved from one area to another to take advantage of additional honey flows. Much of the inspector's time has been spent checking on these bees to prevent the transporting of disease from one area to another.

Since the State was divided into two parts for bee disease control purposes in June, 1938, and the eastern half declared a clean-up area, the inspector has spent most of his time in this area. Here definite progress has been made in controlling American Foulbrood, and it no longer is causing serious losses to beekeepers. Just enough remains (and probably will remain since it is frequently re-introduced) to make constant checking and inspection necessary to keep it under control.

Some time has been spent in the Western Piedmont and mountain areas, and in most places except some of the cities and towns the disease is being held about at a standstill. Most of the time in the western areas has been spent in cooperation

with county agents and vocational teachers. Several meetings have been held to discuss bee disease control, which is essential before we can have profitable beekeeping in the State, and to have bees to pollinate orchards and farm crops.

JAPANESE BEETLE CONTROL

The division of Entomology maintains a State Japanese Beetle Quarantine in cooperation with the U. S. Bureau of Entomology and Plant Quarantine. J. B. Riley, who is located in Greensboro, has charge of the enforcement of this quarantine.

The Japanese Beetle quarantine area includes:

Buncombe County: Townships of Asheville, Limestone, and Swannanoa.

Forsyth County: Townships of Broadbay, Middle Fork, Old Town, South Fork, and Winston-Salem.

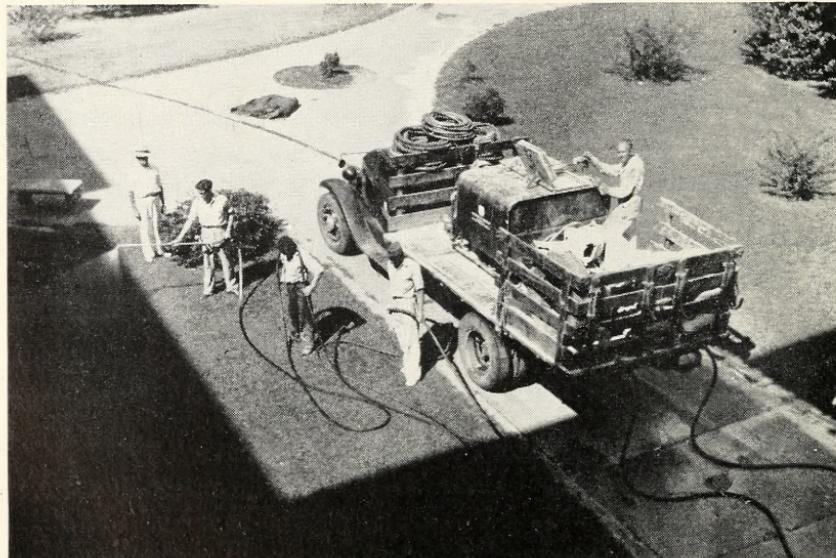
Guilford County: Townships of Morehead and Gilmer.

Henderson County: Township of Hendersonville.

Mecklenburg County: Township of Charlotte.

Rowan County: Township of Salisbury.

The Japanese Beetle Quarantine regulation reads in part as follows: "No nursery, ornamental or greenhouse stock, or other plants, plant roots, or sand, soil peat, compost or manure,



Japanese beetle sprayer in action on the capitol square in Raleigh.

should be transported in any manner from the said infested areas to or through any other part of the State of North Carolina, unless a special permit shall have been issued therefor by the North Carolina Department of Agriculture."

Nursery and greenhouse operators and dealers, after proper inspection, are issued without charge special Japanese Beetle certificates, one of which must accompany each shipment of quarantined material out of the quarantined area. Approximately 3,000 Japanese Beetle certificates are issued each year.

TRAPPING

Japanese beetle traps are placed in certain areas during the summer to determine the spread of the beetle. In a few heavily infested areas in the western part of the State large control traps have been placed. During June and July, 1943, the following traps were placed: Blowing Rock, 100; Burlington, 100; Charlotte, 500; Durham, 300; East Spencer, 100; Elizabeth City, 100; Fayetteville, 200; Gastonia, 300; Goldsboro, 100; Greensboro, 500; Hamlet, 100; Hendersonville, 200; High Point, 300; Raleigh, 500; Reidsville, 200; Rocky Mount, 200; Salisbury, 200; Spencer, 100; Statesville, 200; Thomasville, 100; Waynesville, 100; Weldon, 100; Wilmington, 270; Wilson, 200; and Winston-Salem, 400.

The following Japanese Beetles were caught in 1943: Blowing Rock, 17,405; Burlington, 0; Charlotte, 5; Durham, 2; East Spencer, 127; Elizabeth City, 38; Fayetteville, 0; Gastonia, 52; Goldsboro, 0; Greensboro, 19; Hamlet, 4; Hendersonville, 785; High Point, 9; Raleigh, 13; Reidsville, 19; Rocky Mount, 14; Salisbury, 58; Spencer, 4; Statesville, 1; Thomasville, 0; Waynesville, 0; Weldon, 0; Wilmington, 38; Wilson, 12; and Winston-Salem, 4.

During June and July, 1944, the following traps were placed: Albemarle, 50; Asheville, 1,000; Beaufort, 50; Bessemer City, 50; Black Mountain, 25; Blowing Rock, 400; Brevard, 100; Burgaw, 25; Canton, 100; Chadbourn, 25; Clinton, 25; Columbia, 25; Conover, 25; East Spencer, 50; Elizabeth City, 200; Elkin, 100; Dunn, 50; Fairmont, 25; Fayetteville, 50; Forest City, 50; Franklin, 50; Gastonia, 300; Glen Alpine, 50; Glendale Springs, 50; Greensboro, 400; Greenville, 25; Hamlet, 100; Hendersonville, 600; Hickory, 100; High Point, 200; Jacksonville, 50; Jefferson, 50; West Jefferson, 50; Kinston, 50; Kings Moun-

tain, 50; Laurinburg, 25; Lenoir, 100; Lexington, 200; Linville, 50; Lincolnton, 25; Lumberton, 25; Marion, 100; Mount Airy, 100; Mount Olive, 25; Morganton, 100; Morehead, 50; Murphy, 100; New Bern, 50; Newton, 100; Old Fort, 50; Oteen, 25; Plymouth, 25; Raeford, 25; Rockingham, 25; Rutherfordton, 25; Shelby, 100; Sherwood, 20; Statesville, 50; Spruce Pine, 50; Sugar Grove, 20; Sylva, 50; Tryon, 25; Trade, 20; Valdese, 50; Vilas, 20; Wadesboro, 25; Washington, 50; Warsaw, 25; Whiteville, 25; Williamston, 50; Wilkesboro, 50; and Yadkinville, 50.

The following beetles were caught in 1944: Asheville, 331-722; Azalea, 2; Biltmore Forest (Asheville), 1,715; Biltmore Township, 102; Biltmore Village, 1,689; Black Mountain, 3; Blowing Rock, 138,945; Boone, 3; Burgaw, 22; Calypso, 1; Canton, 3; Clinton, 5; Columbia, 1; Dunn, 222; East Flat Rock, 2; East Spencer, 11; Elizabeth City, 72; Fayetteville, 2; Flat Rock, 1; Gastonia, 60; Greensboro, 8; Hamlet, 1; Hendersonville, 6,529; Hickory, 2; High Point, 26; Lenoir, 4; Lexington, 2; Marshall, 1; Mt. Olive, 2; North Wilkesboro, 1; Old Fort, 1; Oteen, 82; Raleigh, 35; Reidsville, 2; Salisbury, 88; Spencer, 63; Spruce Pine, 6; Warsaw, 10; Washington, 2; West Jefferson, 13; Wilmington, 3; and Wilson, 3.

SOIL TREATMENT

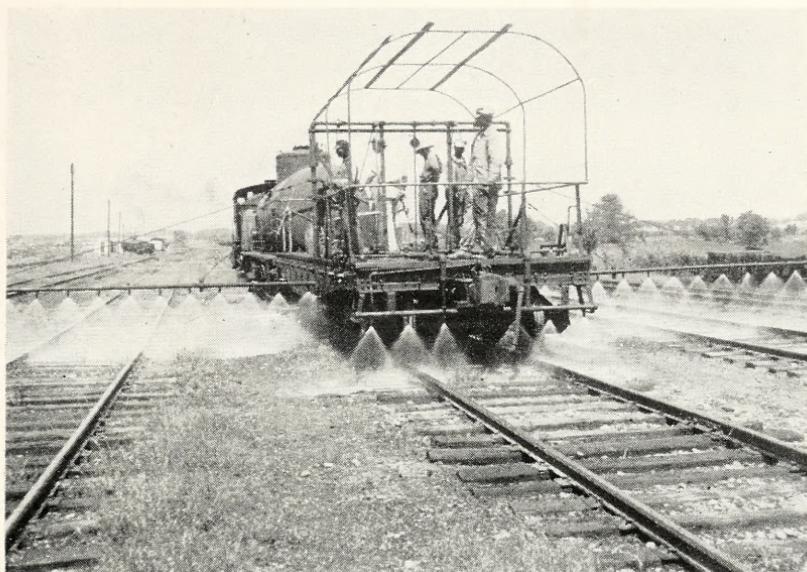
During the fall of 1942 the following areas were treated with 500 pounds of arsenate of lead per acre: Charlotte, 17 acres; Durham, 9; Elizabeth City, 25; Gastonia, 40; Greensboro, 20; Hendersonville, 100; High Point, 15; Raleigh, 43; Rocky Mount, 9; Weldon, 16; Wilson, 6.

During the fall of 1943 the following areas were treated with 500 pounds of arsenate of lead per acre: Blowing Rock, 25 acres; Elizabeth City, 8; Gastonia, 10; Greensboro, 5; Hendersonville, 75; Reidsville, 7; Rocky Mount, 3; Salisbury, 10; Wilmington, 7.

WHITE-FRINGED BEETLE CONTROL

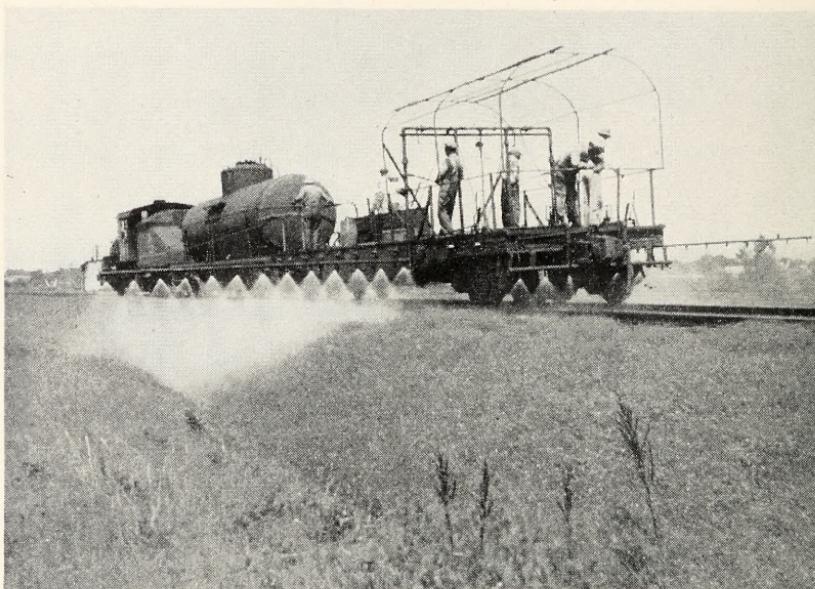
The following report has been submitted by J. A. Harris and G. G. Rohwer. Mr. Harris is State Cooperator in this project and Mr. Rohwer has charge of the Federal activities.

During the summer of 1942, in cooperation with the State Departments of Agriculture, an intensive port survey inspec-



Machine for applying herbicide for white-fringed beetle control.

tion program for the white-fringed beetle was carried on along the Gulf Coast and South Atlantic Coast, south of Philadelphia, Pennsylvania. As a result of this inspection, a new infestation of the white-fringed beetle was found at Wilmington, North Carolina, on July 13. As early as possible, additional inspectors were assigned to North Carolina to determine the extent and intensity of the infestation so that by August 15 a total of ten inspectors were working in the State. Inspections were rather intensive within a radius of approximately fifty miles of all known infested points, and in addition, a scouting inspection of the more important cities and towns was carried on as far west as Winston-Salem and Gastonia, North Carolina. Twenty-five counties were inspected involving a total of 756 man hours. By September 5, the end of the 1942 inspection season, infestations had been found in two additional counties. In New Hanover County, infestations were found in Winter Park, Castle Hayne, Wilmington, and north of Wilmington along U. S. Highway No. 117 and the adjoining Atlantic Coast Line Railroad to and including Wrightsboro in Pender County, infestations were located at Atkinson, Rocky Point and Burgaw; and in Wayne County, infestations were located in and adjacent to the city of Goldsboro.



Applying herbicide white-fringed beetle control.

As a result of the location of infestations in three counties in 1942, a very intensive inspection survey was carried on during the summer of 1943. In this inspection survey, practically the entire eastern half of the State received four inspections and from one to three inspections were made as far west as Asheville and Mt. Airy. These inspections were carried on in eighty-four counties involving a total of 1,875 man days. As a result of this very intensive inspection survey, new infestations were found in four additional counties making a total of seven infested counties. White-fringed beetles were found in Onslow County in the vicinity of Jacksonville and Kellum; in Cumberland County at Hope Mills and Vander; in Robeson County at Lumberton and in Anson County at Peachland. Extensions of the previously known infested areas were also found in New Hanover, Pender and Wayne Counties.

In light of the intensive inspection program carried on during the 1943 season, inspection activities through June 30, 1944, were confined to an area within a radius of approximately fifty miles of all known infested points. By the end of June, small but apparently isolated new infestations had been found at Mt. Olive, Fayetteville, and Cumberland, and minor extensions had been found around previously known infested areas. Twenty-



Sprayer used in white-fringed beetle control.

five counties had been inspected involving a total of 6,937.5 man hours.

In connection with the regular inspection activities carried on to locate new infestations, observations were made in cropped areas for possible damage caused by larval feeding. The superintendent of the New Hanover County Home in Wilmington reported that during the spring of 1942, some insect pest caused considerable damage in one of the corn fields on the county farm. A portion of the field had been replanted as many as six times without obtaining a good stand. Five acres showed a complete crop loss and five to eight acres showed sixty per cent to eighty per cent loss. The descriptions of the damage as well as the number of larvae in the soil indicated that it probably was caused by white-fringed beetles. In addition, potatoes which had been dug from a portion of the farm showed typical white-fringed beetle damage and white grubs had been seen in the potatoes. The caretaker of a farm northeast of Wilmington also reported that he had noted damage similar to that caused by the white-fringed beetle. A limited loss of stand in cotton fields at Atkinson was also observed during 1942 and the populations of white-fringed beetles found present in the fields was sufficient to have caused such a loss of stand.

During the spring of 1943, damage was noted in corn, potatoes, cotton, tobacco, soybeans and Dutch Iris bulbs. The most severe damage occurred to Irish potatoes at Wilmington and Burgaw, a twenty-five per cent loss of stand being noted on the New Hanover County Poor Farm and a twenty per cent loss of stand on the Pender County Prison Farm. An estimated twenty per cent damage also occurred to a small planting of Dutch Iris bulbs north of Wilmington and a similar per cent loss occurred in a tobacco field at Atkinson. This is the first record of white-fringed beetle injury to tobacco. A six-acre corn field at Goldsboro suffered an estimated fifty per cent loss of stand, making it necessary to replant large portions of the field. Damage was also noted in many of the victory gardens planted in the infested areas in 1943, in some cases the gardens being practically destroyed.

During the fall of 1943, damage was noted occurring in an eight-acre field of truck crops north of Wilmington. The most severe damage was noted in the portion of the field planted to collards (87% loss), kale (75% loss), rutabagas (50% loss), and curly mustard (75% loss). It should be noted, however, that the crop practices followed on this truck farm were not the same practices ordinarily followed in trucking areas and presumably, they were inducive to a build-up of the white-fringed beetle population. In the spring of 1944, a sixty-six per cent loss of stand in a corn field and over a fifty per cent loss of stand in a cucumber field was noted north of Wilmington. Limited damage was also noted in fields planted to lettuce, cabbage, beets, snap beans, collards, corn and Irish potatoes.

During the summer of 1942, no control activities were carried on. Prior to the beginning of control operations in 1943 and 1944, the owners of the properties which were to receive treatment were notified in writing of such treatment. Suppressive control measures were applied to all of the known infested areas in 1943 as soon as possible after emergence began. As new areas were found infested, the control operations were extended to take in those areas. In 1944, an attempt was made to obtain a coverage of insecticides in some of the more isolated areas prior to the time that emergence occurred. In the more generally infested areas, the control measures were designed to reduce populations. The intensity of the measures applied in both 1943 and 1944 varied with the density of the population taking into consideration other factors such as the hazard

of artificial and natural dissemination, the size of the infestation, and the type of acreage under treatment. In general, more drastic suppressive measures were applied to the isolated infested points. During the summer of 1943, a total of 6,047 acres were treated at least once. By June 30, 1944, 4,024 acres had received at least one treatment; however, a considerable acreage set up for treatment had not been treated by June 30th.

The insecticides used in the control program were calcium arsenate and cryolite applied either as a dust or dilute spray. The use of calcium arsenate was restricted to those areas where livestock was not permitted to graze. Cryolite was applied over the balance of the areas, in view of the fact that it apparently is not harmful to livestock. Insecticidal dusts were used in crop land and in idle land, being applied with row crop and orchard type power dusters. Dilute spray was applied in residential areas where dust would be objectionable and in addition around points presenting a considerable hazard of artificial dissemination since the sticker in the spray made it possible to maintain a coverage over a longer period of time under unfavorable weather conditions. In addition to the application of insecticides, a sodium arsenite base herbicide was applied in the railroad yards at Goldsboro and Wilmington and around a few other industrial concerns where there was an appreciable risk of artificial dissemination. As the herbicide is extremely poisonous to livestock, its use was necessarily restricted to areas where stock would not graze. However, in areas where it was used, the herbicide materially reduced the weed growth conducive to white-fringed beetle populations and in addition tended to drive the white-fringed beetle from the areas treated in addition to acting as a stomach poison and contact insecticide. Limited weed cutting with power mowers and hand labor was employed especially around points of artificial dissemination where the poisonous herbicide could not be used. Such weed control made it possible to obtain a better coverage with insecticidal sprays.

Larval population figures are obtained from the regular permanent survey properties located in each infested area which are sampled each January in order to determine populations and to obtain other life history data.

At least partially as a result of the 1943 control operations, there was a general reduction of sixty-nine per cent in soil populations as of January 1944.

NARCISSUS BULB INSPECTION

J. A. Harris and Dr. D. L. Wray have carried out this exacting work, which is of immense value in protecting bulb growers from serious nematode infestation.

In 1943, a total of 58 acres of bulbs on 6 properties were inspected. No nematode infestation was found.

In 1944 a total of 65 acres on 10 properties were inspected. One variety on one property was found infested with nematode. This variety will be given the standard hot water treatment.

Narcissus shipping tags were issued to cover each package shipped.

EUROPEAN CORN BORER

Previous to 1942 only 3 counties (Currituck, Camden and Pasquotank) were found to be infested. Further scouting in 1942 revealed infestations in Chowan and Tyrrell Counties. In 1943 scouting was considerably expanded with infestations discovered in Beaufort, Hyde, Perquimans and Washington Counties. All counties bordering the infested counties were carefully scouted also. Larval population counts by Federal agents showed a heavy increase of borers in 1943 over 1942. These counts were made in 3 counties.

BLISTER RUST CONTROL

Blister rust control work headquarters have been moved from Asheville to Boone. H. B. Teague is in charge of this program for the Federal government. Those who desire detailed information on this program can obtain copies of Mr. Teague's annual reports on file in this office for reference. The auditor's report will show the itemized expenditures in connection with the Blister Rust project.

INSECT SURVEY

Dr. C. S. Brimley has charge of insect identification, and the care of the division's very valuable collection and insect files. The collection and records are available for consultation by all workers in the State. Many come from distant states to consult with Dr. Brimley, who is regarded as one of the nation's ablest taxonomic entomologists.

DIVISION OF MARKETS

RANDAL B. ETHERIDGE

This biennium has covered one of the most critical periods in the history of North Carolina agriculture. War production goals set up by the State Goals Committee and the War Food Administration have resulted in increased production of truck crops, peanuts, livestock, poultry and other products. This has made the problems of distribution even more difficult, particularly with respect to our efforts to assist inexperienced producers and handlers.

Further complications have resulted from Federal programs of price support, price control, rationing of machinery, materials, equipment and supplies. The natural result, of course, was greater demands upon this division for advice and assistance; in fact, it has been necessary for us to assume the responsibility of active business leadership for producers, handlers and shippers of various farm products. In addition to emergency calls, our established marketing programs have been expanded and adjusted to meet changed conditions.

A revolving fund has been used to assist in the marketing of beef cattle, sheep, eggs, poultry and sweet potatoes. Technical and practical assistance has been given in the allocation, construction and efficient operation of dehydration plants, poultry processing plants, freezer lockers, concentration markets for fruits, vegetables and pecans and to the Quartermaster Market Center of the U. S. Army.

Post-war plans have been made in an attempt to help cushion the shock from diminishing Army, Navy and lend-lease purchases. The groundwork has been laid for the expansion of local processing facilities; so, we should be able to grow, process, distribute and consume finished North Carolina products at home. Constant attention has been given to improvement in handling perishable products in an effort to eliminate costly adjustments at terminal markets and to meet keen competition from other states.



R. B. ETHERIDGE

This division is justifiably proud of its service record and looks forward to opportunities for serving the agricultural interests of North Carolina in the belief that we shall be able to apply the experience that has been gained during this difficult period and, consequently, shall be more able to handle efficiently the problems of adjustment that undoubtedly lie just ahead.

FRUITS AND VEGETABLES

Purchases of North Carolina produce for the armed services amounting to more than two million dollars in the last two years have given North Carolina farmers the greatest local demand for fruits and vegetables in the history of the industry. This increased demand has resulted in produce being grown in increased amounts in relatively new areas of the State by farmers inexperienced in grading and packing to meet the requirements of government specifications with respect to grade.

Our fruit and vegetable specialists have devoted a considerable amount of time to the instruction of growers in practically every fruit and vegetable growing county in the State with respect to proper methods of preparation of their products for market, including harvesting at the proper stage of maturity, grading, packing and, in many instances, loading shipping and directing the making of sales.

Much time and effort has been spent to improve the quality of North Carolina sweet potatoes shipped to terminal markets and to secure for this industry its rightful place of importance. We are pleased to report progress on this program. Sweet potatoes produced in the Piedmont section of North Carolina, which formerly were sold in bulk to truck operators below the prevailing market prices, were assembled, graded, packed and marketed through the Quartermaster Market Center and other carlot buyers at premium prices.

Since Louisiana is generally conceded to have the best seed stock of sweet potatoes, one of our marketing specialists was sent to that State to purchase six carloads of the best certified seed available. These seed potatoes were brought into North Carolina and distributed by this division in cooperation with the county agents among several hundred farmers at cost. Under average conditions, approximately 72,000,000 propagations should be obtained from this seed stock, which, if systematically revolved, will furnish sufficient seed stock for the entire State within three years.

When surpluses develop in certain commodities, markets must be found immediately. Members of this division assisted the War Food Administration in the purchase of 5,220 cars of white potatoes, snap beans and apples. All these cars purchased by the War Food Administration were checkloaded and vouchers were prepared for payment to the growers by these inspectors.

In June, 1943, the movement of the entire potato crop was frozen by the Federal government to assure the armed forces of an adequate supply. This order made it necessary for shippers to secure shipping permits and required certification as to grade. However, it was apparent when harvesting began that such an order was not necessary; for, in response to urgent appeals from and a guarantee of support prices for potatoes by the Federal government, our farmers and farmers from competing states produced a record crop, and a large surplus developed early in our shipping season. Market prices dropped below support-price levels and terminal markets afforded practically no outlet for our potatoes.

In spite of repeated warnings given to Washington officials of the probability of a large surplus and specific requests that they be prepared to set up the necessary machinery for the purchase of potatoes, when the surplus materialized, they were five days late in putting their support program into operation. Subsequently, shipping and purchase holidays were declared from time to time, causing confusion and producing a very demoralizing effect. This division did everything possible to help conditions. We kept growers and handlers informed fully of every change made in the program. We recruited and trained forty additional men to handle the inspection and checkloading and give any other assistance needed to operate their program.

Through our specialists in the field, we kept Washington and Raleigh officials informed day by day with respect to field conditions. We also met with War Food Administration officials in an attempt to work out a suitable program for North Carolina. When the occasion arose, we protested vigorously against purchase and shipping holidays and any failure to fulfill promises made to our farmers. While we were not able to secure an entirely satisfactory program, we were able to give effective leadership to our producers and assist the Federal Department in a program which eventually absorbed the surplus without loss to most farmers.

Since a large percentage of the fruits and vegetables marketed by North Carolina growers is bought and sold on the basis of grade, our inspectors, who are licensed by the Secretary of Agriculture, act in a neutral capacity in grade certification. We employ on a temporary basis each shipping season 150 men for this inspection service, which is furnished to the growers and shippers at cost and is self-supporting. They operate from field offices so located that they are able to furnish inspection service to every shipping point in the State. Although this project is seasonal and the men are employed on a temporary basis only, the work is highly technical and the inspectors are required to pass successfully an examination before they receive licenses from the U. S. Department of Agriculture, permitting them to perform the work and sign joint Federal-State certificates which are issued covering the quality, condition and grade of products.

During the past biennium our specialists inspected and certified as to grade 8,479,405 packages of fruits and vegetables, the equivalent of 24,211 carloads. White potatoes, sweet potatoes, peaches, strawberries, shelled and unshelled peanuts, watermelons, cantaloupes, corn, tomatoes, apples, peppers, cucumbers, beans, huckleberries, squash, egg plant, dewberries, peas, cabbage, lima beans, okra, turnips, radishes, onions, carrots and pecans comprised the bulk of the commodities inspected.

In addition to the shipping-point inspection service furnished, receiving-point inspection performed by members of the division under authorization of the U. S. Department of Agriculture has increased sharply. During this biennium, 175 cars shipped into North Carolina have been inspected. This type of inspection is used by receivers of produce when deterioration has occurred in transit or when the quality, condition or the grade is thought to have been misrepresented at the time of purchase. Inspections were made for wholesale dealers, brokers, distant shippers, railroad companies and Army camps in the State. Under this same authorization, inspection and sampling of certain processed foods were done for the Army, Navy and lend-lease.

A demoralized Irish potato market continued throughout the 1943 shipping season and extended into 1944. Due to heavy shipments from the New England States and other producing areas, Western North Carolina growers were without a market in the spring of 1944 for their crop, which had been stored.

Four specialists from this division were assigned to this area. They assembled, graded, inspected and assisted in selling 35,550 sacks, the equivalent of seventy-nine carloads, from twelve counties to the commercial trade at prices equal to or above the government support price.

For a number of years our grape crop has not been considered very important from a commercial standpoint; however, thousands of bushels are now being sold annually to the bonded wineries in this and other states. In 1942 the prevailing price paid to grape growers was \$1.80 per sixty-pound bushel; while in 1943, after specialists of this division had worked on the matter, the general price level was raised to a minimum of \$3 per bushel, or an increase of \$1.20.

The staff of this division has been instrumental in the establishment of three new produce markets in Western North Carolina, namely, at West Jefferson, Hendersonville and Boone. These central markets have served to solve the transportation problem of farmers of that area who formerly sold through out-of-state markets, and they have made possible the utilization of considerable truck acreage by the farmers of that section in addition to securing a greater cash return for their produce. As these markets have developed, the growers have learned approved methods of harvesting, grading and packing. In addition to the promotion of these new markets and the assistance given in their operation, continued assistance was given to those markets already established. Specialists were assigned to four markets to direct sales and assist in the operation of the markets. They were Johnston County Produce Market, which sold miscellaneous farm products amounting to \$168,092.04; Mount Olive, which sold 165,722 packages of fruits and vegetables; Faison, which sold 328,928 packages of fruits and vegetables; and Whiteville, which handled pecans only and sold 319,653 pounds for farmers, amounting to \$73,257.29. Particular emphasis was placed on plans for improved facilities and proper methods of grading and packing. Sales and sales records were supervised at some points for the protection of farmers.

In an effort to assist and enable the canneries of the State to meet the requirements necessary to sell their products to the Government for the armed forces and lend-lease, one of our marketing specialists was assigned to this work. It is the purpose of this division to improve and expand the canning industry in North Carolina, thereby providing a new industry for

the utilization of the farm products of the State and one that will furnish a market for surplus commodities after the war.

Growers have continued to receive protection under the operation of the Handlers Act. All handlers who have received permits under the Act have first secured the approval of their contract forms and have established their financial responsibility.

The prices charged for seed white potatoes advanced sharply during this biennium, making even more necessary the enforcement of the rules and regulations adopted by the Board of Agriculture, which require that all potatoes sold for seed purposes in North Carolina meet the requirements of the U. S. No. 1 Grade. This division was charged with the responsibility of enforcing these regulations and was instrumental in securing many substantial adjustments between out-of-state shippers and our growers that would otherwise have resulted in losses.

Three new marketing bulletins have been prepared and distributed to growers, shippers and receivers of fruits and vegetables. The popular "What, When and Where of North Carolina Fruits and Vegetables" was revised to give current information. "Marketing North Carolina Sweet Potatoes" and "Marketing North Carolina Cantaloupes" have also been distributed to growers in an effort to assist them with respect to modern practices in harvesting, grading, packing and marketing the respective products. In addition to the assistance given by these bulletins, written instructions concerning marketing various commodities go out to individual farmers in our daily mail.

A specialist of this division devoted considerable time to the subject of dehydration. He constructed the first pilot plant to be operated in the State and made successful tests in the dehydration of cabbage, sweet potatoes, blackberries and white potatoes. A commercial plant was constructed at Mount Airy under his supervision to dehydrate these products. Since its completion, a considerable tonnage of cabbage has been dehydrated and marketed to government procurement agencies for the armed forces and lend-lease. This plant is now recognized as one of the best commercial dehydration units of this country. A new, modern plant for the dehydration of sweet potatoes was constructed in Columbus County. Due to the high prices that have prevailed for sweet potatoes since its construction, it has not been operated; but, when the need for a plant of this type arises, its operation can be commenced almost immediately.

The personnel of this division has been very active in trying to prevent the establishment of any support or ceiling price which would constitute a discrimination against our North Carolina growers of fruits and vegetables. This has required constant vigilance, many conferences with Federal employees charged with this responsibility, and the preparation and presentation of pertinent crop-condition information from time to time.

We have found it necessary a number of times to make formal protests against various ceiling prices after their announcement. In support of such protests, we have prepared cost-of-production figures and used every argument suggested by our experience and knowledge of marketing practices to secure the establishment of ceiling prices which would not discriminate against our growers, would yield fair returns and, at the same time, accomplish the purpose for which they were intended. The following are examples of our activities along this line:

In 1943-1944 ceiling price on sweet potatoes was first proposed at \$2.25 per bushel f.o.b. North Carolina shipping points. Efforts were made to secure a higher ceiling price to offset the high cost of production and allow some remuneration for storage. As a result of protests filed, the announcement of this ceiling price was postponed until December, 1943, when it became apparent that a ceiling price would be placed on this commodity



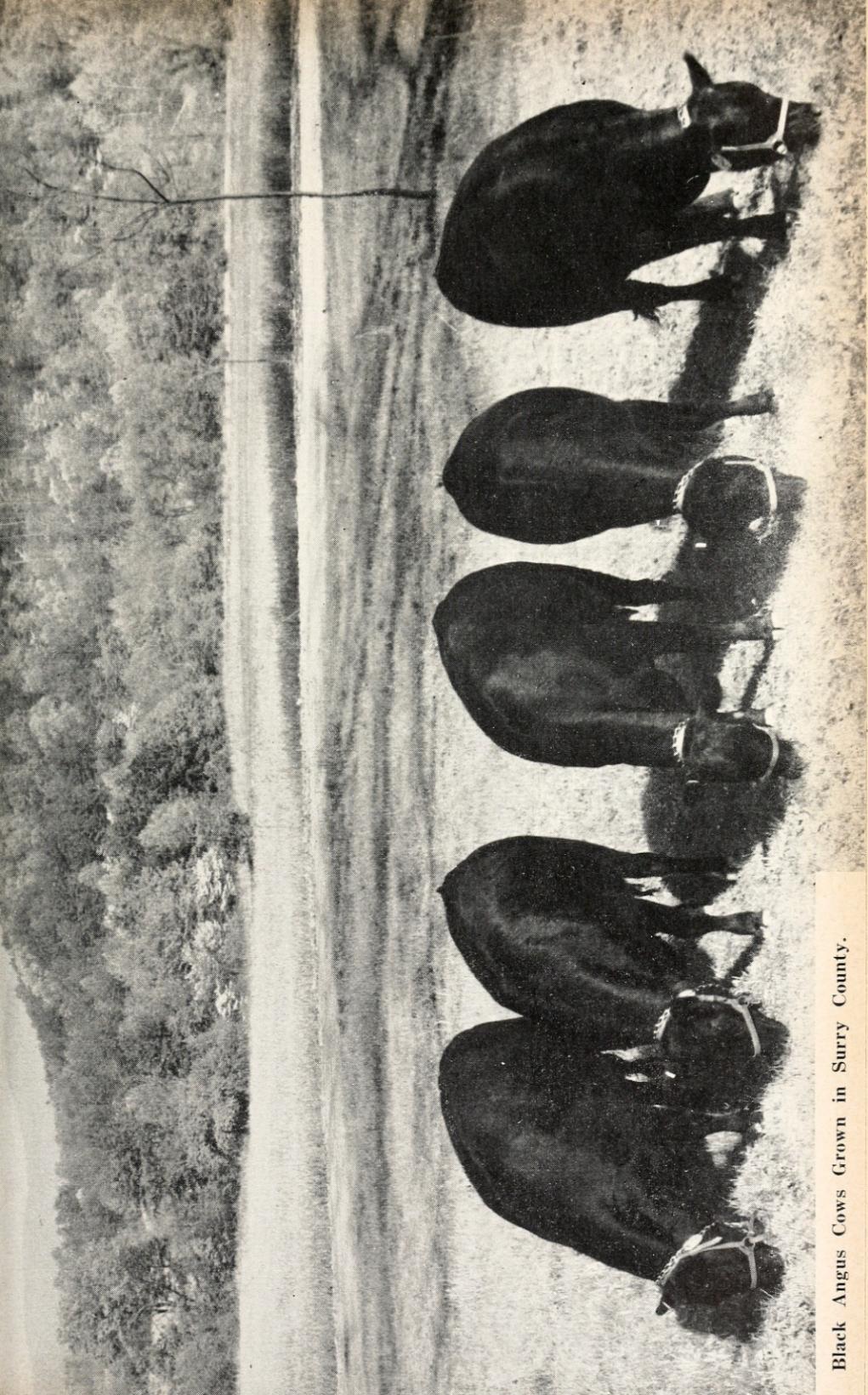
Sweet potatoes packed as approved by Markets specialist
for shipment to terminal markets.

immediately. Again, a member of this division met with officials of the Office of Price Administration and the War Food Administration in Washington. As this conference progressed, it appeared that an agreement could not be reached. Our representative then proposed the freezing of sweet potato prices at the current market level, which was done. The net result of this was that our ceiling was approximately \$3.40 instead of the proposed \$2.25, a two-million-dollar increase in income to North Carolina sweet potato growers.

The ceiling price on North Carolina watermelons was set at \$20 per ton. We immediately advised growers and shippers the action that had been taken and made necessary arrangements for a member of this division to accompany a group of these growers and shippers to Washington. There, we learned that the information used in arriving at the announced ceiling price was quite different from the statistics we had prepared in support of a higher ceiling price. This so impressed the authorities that our representative was made secretary of a national committee appointed for the purpose of preparing a brief, setting forth the objections to the announced ceiling. This brief was prepared, presented to and accepted by the Office of Price Administration, and it resulted in a \$15-per-ton increase in our ceiling price, the equivalent of \$210 per car.

The 1943 Irish potato ceiling was announced at \$2.40, with a floor of \$2.25, or a differential of only fifteen cents for handlers. All shippers threatened to discontinue shipments, as it was impossible to operate on this margin. Also, this ceiling price was regarded as a discrimination against North Carolina when compared with ceiling prices allowed in Florida and other Southern States. Meetings were held with growers, shippers and State agricultural agencies in an effort to determine a reasonable adjustment. The final result was a ceiling price of \$2.70 per hundred pounds, or double the original margin for operation and an increase in revenue of \$90 per car.

Our 1943 strawberry crop was so short that it was not difficult to convince OPA officials that price control was not necessary. We were informed, however, that a ceiling price would be placed on the 1944 strawberry crop. As the 1944 season developed and conditions pointed to the smallest strawberry crop in years, we made every effort to forestall the announcement of a ceiling price to apply to the North Carolina crop, pointing out that since Florida, Louisiana and other Southern States



Black Angus Cows Grown in Surry County.

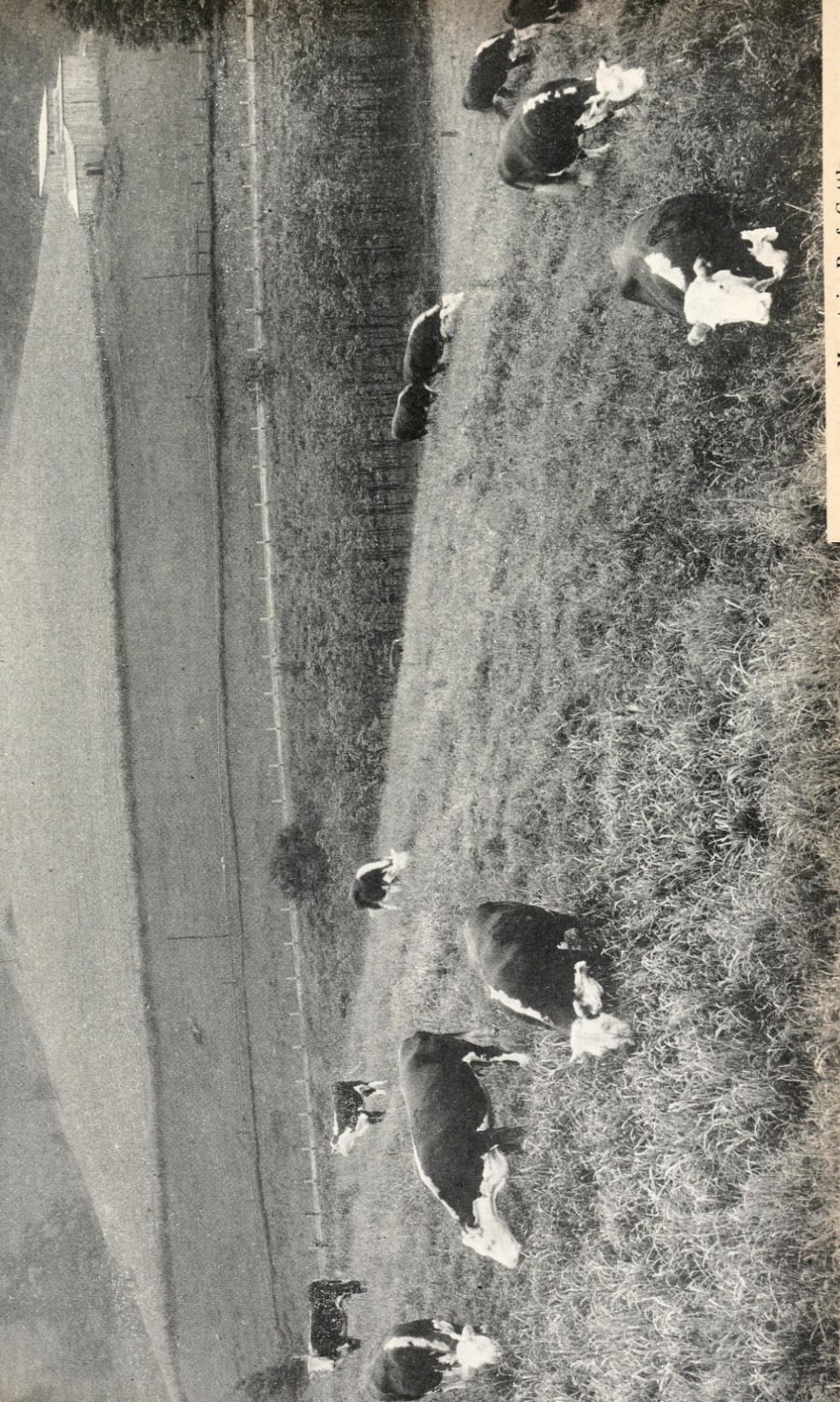
moved their crop without the operation of a ceiling, the placing of one on the North Carolina crop would constitute a discrimination. As a result of this delaying action, growers were able to move a large portion of their crop before the ceiling was announced and its announcement at prevailing market prices did not work a hardship. It is estimated conservatively that our strawberry growers collected at least \$150,000 more than they would have secured had we allowed a ceiling price to be announced without making a fight.

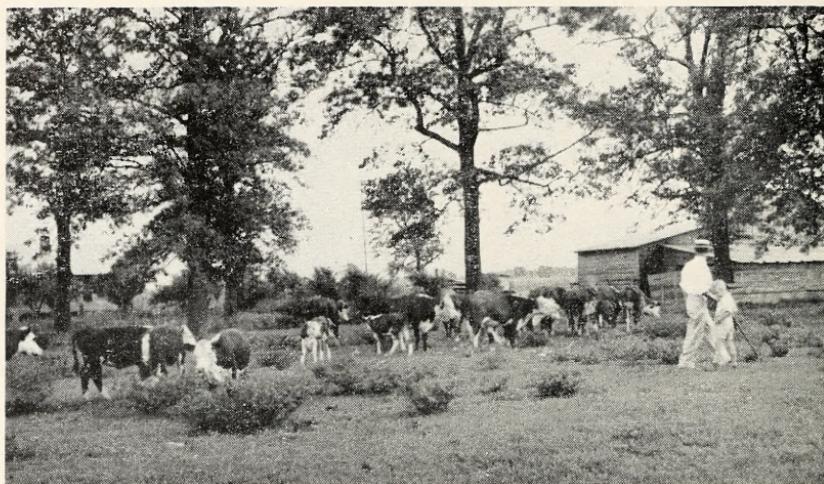
This division was largely responsible for convincing OPA officials that a ceiling price on blueberries in North Carolina would prove to be detrimental to this "infant" industry. We pointed out that the cost of producing blueberries was relatively high; that the volume of production was too insignificant to produce an inflationary effect and that the placing of a ceiling price on this product would operate to destroy interest in the crop and the future of this new enterprise in North Carolina.

No provision was made in the 1943 pecan ceiling price order for a differential between thin-shelled and thick-shelled varieties; in fact, under this order thick-shelled varieties were being sold on the basis of count per pound, resulting in a premium price being paid for thick-shelled pecans though premium prices had previously always applied to the thin-shelled varieties. Members of this division met with OPA officials and were successful in bringing about an adjustment of four cents per pound as a premium price for thin-shelled nuts without having to take a reduction in the ceiling price for the hard-shelled varieties to compensate for the increase. This accomplished the dual result of securing an increase in the total income for pecan growers and the continuation of the well-established market practice of higher prices for paper-shelled pecans.

Effective work was also done by the division with respect to ceiling prices on peaches, dewberries, wild blackberries, grapes, snap beans, lima beans, cabbage and cucumbers.

Our personnel has served in an official or advisory capacity on many of the State agricultural committees, some of which are State War Food, State Potato Committee and State Production Goals Committee. We were called upon to head up the used-container salvage drive.





Beef cattle in Eastern North Carolina.

LIVESTOCK

The cooperative cattle program, inaugurated by the division in 1941 in cooperation with the State Highway and Public Works Commission, whereby cattle are purchased in the producing areas of the State, largely in the mountain section, and shipped in carload lots and sold to farmers in other sections at cost, has been continued with a decided increase in volume. The only change in the original set-up is that the revolving fund for financing the purchase of cattle has been set up by the Department of Agriculture instead of through the Highway Commission as was formerly done. However, through the courtesy of the Highway Commission, farms under the control of the Prison Division of the State Highway and Public Works Commission will continue to be used as distribution points.

Definite results, confirming the success of the program, can be readily recognized in the increased number of better grade cattle being marketed in the eastern area. A large number of fine calves and young cattle produced from the grade herds established under this program is now being sold at good prices. Our specialists are definitely of the opinion that a safe and sound cattle industry is built up by the establishment of numerous small herds of good grade cattle rather than through encouraging the production of purebred or registered animals.

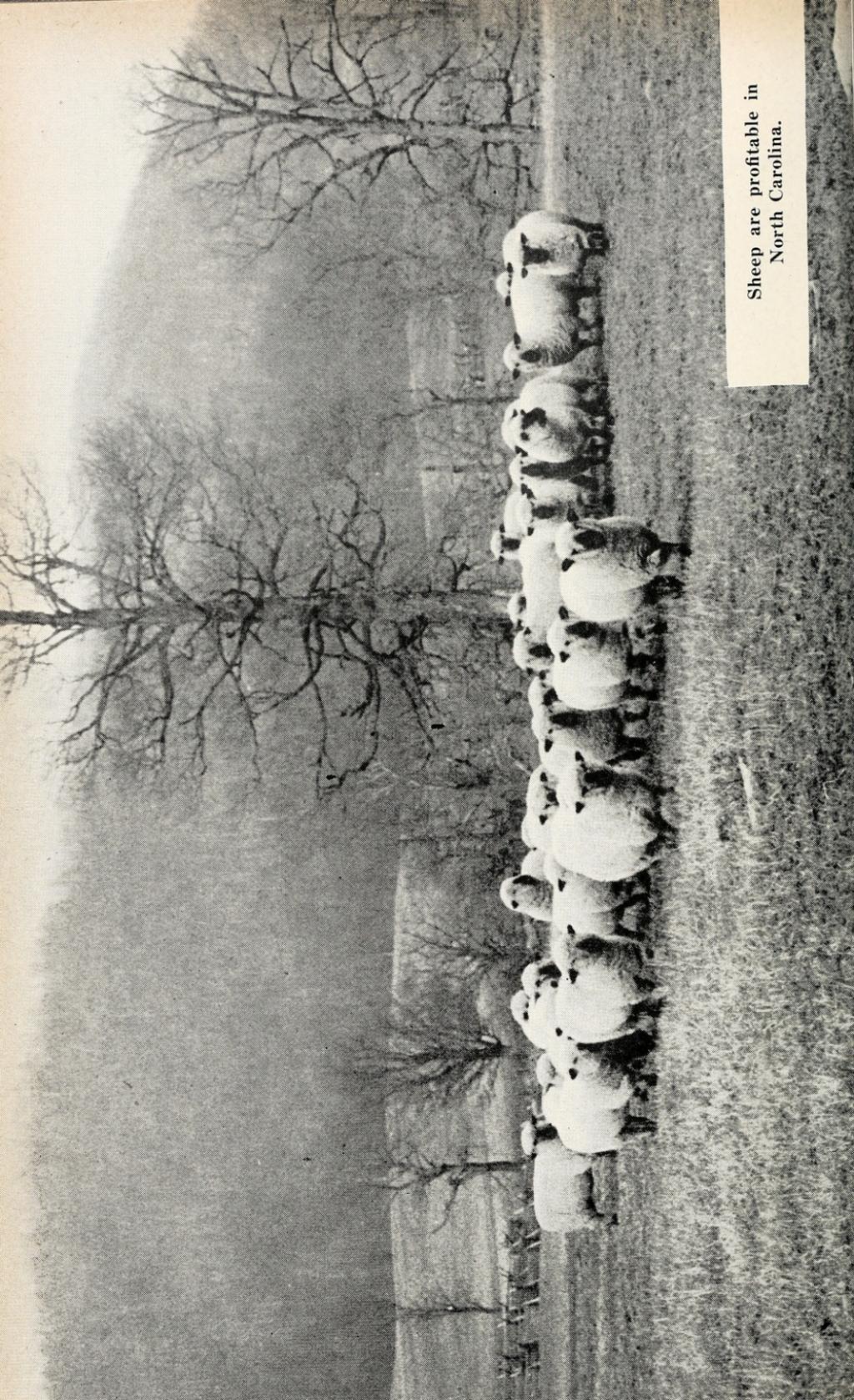
A feeder bulletin has been published annually. This bulletin lists 1,500 farmers in the State who have cattle for sale, with a

brief notation of the number and kind of cattle each farmer offers. This information has been circulated widely and has been of great value to our farmers and stockraisers in disposing of their surplus stock. Most of the cattle purchased under the revolving fund program has been distributed from Caledonia Farm, the chief distributing point at the present time. Other points for distribution will be established as soon as the demand is sufficient for carload shipments. A number of farmers in the State can use a carload of cattle, in which cases direct shipments are made. During the period covered by this report, more than 2,000 head of cattle have been purchased and resold. Feeder calf sales, sponsored by the division, have been held successfully at Asheville, West Jefferson and Clyde. Since these sales have been established, it has been possible for 4-H Club boys to purchase desirable calves produced in North Carolina by North Carolina farmers.

Timely and constructive advice has been given to cattle feeders and breeders from time to time on the trend of cattle values and general market conditions through various publications, market reports and the press. Representatives of the division have also assisted in the purchase and sale of several thousand head of cattle for use on the Caledonia and other State-owned farms operated by the Prison Division of the State Highway and Public Works Commission.

In an effort to revive the sheep industry in the State and restore it to its former important position, the division initiated a service by which its facilities are used to provide a State-wide service for our farmers to purchase sheep needed to balance their farm economy as well as to supply our fighting forces and citizens with adequate food and clothing. During this biennium, 2,250 western breeding ewes were brought in from Montana and Wyoming and ninety purebred rams were placed with flock owners. These ewes and rams were purchased with Department funds and were resold to farmers at actual cost.

Lamb graders and specialists helped in the grading of 11,882 spring lambs, which were shipped from cooperative pools. Material assistance in all phases of marketing sheep, lambs and wool was given to producers through letters, bulletins and personal visits.



Sheep are profitable in
North Carolina.

DAIRY PRODUCTS

In our dairy marketing activities during this biennium, emphasis has been transferred from increased consumption to a wise use of our available dairy products. We have concerned ourselves primarily with the prevention of waste of these essential foods while continuing to stress their food value and warn against any change in food habits that might result from a decreased consumption of dairy products both now and after the war that would have a serious effect on the health of the State.

Since we must attain our objective principally through education, we visited schools and made 51,865 contacts with school children and adults. This work was mainly with school children, but adults were reached through parent-teacher, civic and other groups. Various means were used to tell the story of dairy products, such as, health education motion pictures, talks, animal-feeding experiments, displays and printed materials. Recognizing the value of this program, eight dairies contributed \$225 for use in purchasing educational materials for schools in their localities.

Outstanding projects were conducted at Elkin and Charlotte. The Food-Health Efficiency Campaign at Elkin lasted for two weeks and consisted of intensive work with schools, civic groups and industrial plants. The Red Cross School Nutrition Program at Charlotte, in which our specialist participated, consisted of a series of programs varying in character from week to week and given once a week for a period of five weeks in the city schools and later in the rural schools. Reports indicate that improved diets resulted from these programs.

Recipes have been compiled and material prepared for the publication by the division of a dairy cookbook during the fall of 1944.

Our specialist has attended meetings of the North Carolina Grange. The Parent-Teacher Association and various home economics and dairy products groups in an effort to work with each of these organizations in their activities and enlist their assistance in the furtherance of our projects, as well as to be able to determine how best to relate the various programs.

Inspection service was furnished to the plant at North Wilkesboro engaged in the dehydration of milk, which enabled it to sell several carloads of powdered milk for lend-lease ship-

ment. Butter grading was furnished to farmers at curb markets in Greensboro, Durham and Raleigh.

FREEZER LOCKERS

The number of freezer locker plants in the State has increased from seven units in 1942 to twelve, with many others contemplated or in the process of construction. We have a specialist assigned to this project, assisting operators to secure approval for construction and giving information with respect to construction and efficient operation. Many of the locker plants operate a meat-curing service, and one of the objectives we have in the operation of this project is the standardization of a single method of curing meat, with emphasis on the uniform curing of hams that may be marketed as a standard, labeled product of such quality as to establish a trade reputation.

FIELD CROPS

This phase of our work has expanded in answer to a definite need for a marketing program geared to keep pace with our steadily increasing production of field crops. Farmers in ninety-two counties were advised individually and in groups the requirements for marketing small grains, lespedeza seed, soybeans, hay and straw. These personal contacts were supplemented by three motion pictures, in color, illustrating the proper preparation of hay and lespedeza seed for market. In addition, three bulletins—"Marketing Lespedeza," "Marketing Soybeans" and "Marketing Wheat"—were given wide distribution.

This was followed up by assistance in selling more than a half million bushels of wheat, oats, soybeans, corn, rye, lespedeza seed and more than a thousand cars of hay and straw. Increased production of small grains to be milled for feed and flour has necessitated adjustments in the whole distribution system, especially in the use of definite standards for quality and in proper farm and public storage. In our effort to solve these problems, full cooperation was given to other State and Federal agencies, millers, distributors and producers for the purpose of securing better handling, marketing and storing of small grains. To determine quality and to facilitate sales, 1,121 samples of grain were certified as to grade. In the prosecution of this work, 489 visits were made in fifty-one counties and twenty-five illustrated lectures were made to 2,108 future farmers and adults.

Peanut hay in large quantities appeared on North Carolina markets in the fall of 1942 as a result of the larger acreage of peanuts planted for oil. Since there were no established standards for peanut hay, there was no price differential for quality, which fact usually forced the producer to sell at the level of the poorest grade. To correct this condition, specialists of this division, together with representatives of the U. S. Department of Agriculture, worked out peanut hay standards, which were adopted and put into operation in 1943. This benefitted the producers and was a direct aid to farmers and dairymen in drought areas, who were able to purchase the type and grade of hay they desired either from individuals, dealers, or through the Commodity Credit Corporation.

Our growers have realized that they have had a definite advantage over growers from competing states in the marketing of lespedeza seed. The standards formerly adopted by the North Carolina Department of Agriculture are recognized by the seed trade as a sound basis for the determination of quality and value. The result is that there has been a noticeable increase in the demand for North Carolina lespedeza seed in direct proportion to the steady improvement in quality. We have visited and assisted three hundred seed cleaners and dealers in fifty-five counties in the better preparation and marketing of this product.

Full cooperation has been given to Federal agencies responsible for handling commodity loans on a farm-stored corn, wheat and soybeans. The AAA designated a supervisor for the sampling and our inspectors made the analyses and determined the grades on these grains for farm loans.

TOBACCO

This division has represented the North Carolina tobacco industry in all meetings held by the Office of Price Administration and the War Food Administration on price control. We served on various committees in many meetings with producers from other districts in an attempt to secure equitable prices for graded and tied tobacco. The division has had representation in all meetings before the Ways and Means Committee of the Congress to oppose any increase in tax on cigarettes and other tobacco products.

Information collected by this office from warehousemen on prices and poundage handled by warehouses and markets on a

monthly and seasoned basis has been compiled and distributed to interested parties. These reports have furnished the basis for all statistics relating to the North Carolina tobacco industry. Interest in them has been widespread, evidenced by the many requests we receive for them from those engaged in the tobacco trade, the press and various civic organizations.

Our representative and representatives of the War Food Administration, with which we have a cooperative agreement, held 493 farm demonstrations of tobacco grading with an attendance of 11,969 farmers. These demonstrations were held in cooperation with county agents and vocational teachers. Evening adult classes in tobacco grading were held in twenty vocational schools with an attendance of 521. Instruction was given to 2,147 students in regular classes of seventy-three vocational schools. Also, a tobacco exhibit was put on at the seed show in Greenville, where several hundred pieces of tobacco literature were distributed.

The Farmers Federation, a cooperative at Asheville which acts as an agent for the Commodity Credit Corporation to assure the farmers that they will receive ninety per cent of parity for their tobacco, was given assistance in this program.

POULTRY

North Carolina poultry almost doubled in number during this biennium. This increase under wartime conditions of price control, building limitation, scarcity of equipment and materials has created new and accentuated old problems. Inadequate dressing and packing facilities have caused serious losses in revenue, because we have not been able to realize fully the profits to be derived from processing or to use completely its by-products. Many of the existing plants were not equipped or operated in such a manner as to meet the Army purchase specifications. Turkey production became large enough to create a demand for dressing facilities and inspection; so, we arranged for three of our specialists to attend a turkey grading school, where they qualified and received Federal licenses.

To meet these conditions, we encouraged the construction of three new poultry processing plants and the remodeling of some existing plants. We helped obtain priorities for their construction material and operating equipment, conferred with the operators with respect to the arrangement and assisted them

in the initial operation of these plants. This resulted in their approval by the Army Quartermaster Corps, thereby opening an outlet for large sales to Army establishments and other volume buyers. This accelerated rate of processing with its consequent demand for shipping containers in volume, the supply of which was already very short, prompted us to secure the re-opening of a barrel plant in Durham and the location of a box-making plant at Siler City to relieve the shortage. We are extending our assistance to other plants in need of improved facilities and are aiding them as rapidly as conditions permit.

Since the majority of dealers had difficulty in interpreting ceiling price regulations, we prepared a simplified table for their use, which enabled them to work out their local prices.

The Raleigh State Market has operated on a one-day-per-week basis and has handled 87,000 pounds of poultry, thus helping to stabilize the local market.

CAPONS

This is a new industry for this State and one which should develop into a sizeable cash crop for North Carolina producers. During this biennium intensive work was done with seventy-five farmers in seventeen counties. Eight thousand cockerels were caponized, ten men were trained to caponize and we arranged with four hatcheries to sell baby capons. We arranged for the sale of 14,000 pounds of dressed capons for farmers, who were advised when to kill them and how to dress the birds for prime market conditions.

EGGS

North Carolina egg production increased approximately twenty-six per cent over the preceding biennium. Particularly in our surplus producing season, every type of assistance at all trade levels was necessary to handle the increased volume and insure adequate returns to producers, to supply the armed forces with graded eggs and to conserve eggs for our season of low production. The program which we helped to initiate and operate in conjunction with cooperative marketing associations, along with our cooperative marketing projects with large handlers and producers, was continued to stabilize prices to the producer. Under this program, 4,832,447 dozens of eggs were collected by trucks on five routes and in 124 towns and communities. These



Demonstrating the value of clean eggs in Federal-State egg grading work.

collections were made at country stores, filling stations, produce markets, seed and feed stores and at other assembly points; consequently, all types of business participated in and were benefitted by this program.

Three types of projects of various kinds were designed to take care of specific conditions. The ten-case or "retail-program" plan was used and eggs were certified for Pine State Creamery and Swift and Company of Raleigh; Fresh Air Market, Hickory; Champion Poultry Farm, Champion; Farmers Federation Co-operative and West Produce Company, Asheville; and Armour and Company of Charlotte. The wholesale egg program with certification as to grade was operated in Durham, Champion, West Jefferson, Asheville and Raleigh. The current-receipt program, without inspection, was operated in Marshville, Monroe, Winston-Salem and West Jefferson.

These projects made up a broad purchase program which necessitated distribution adapted to its volume. Thousands of cases of eggs were sold to Army camps, veterans' hospitals and to other government purchasers. Approximately nine thousand cases purchased by the War Food Administration were received

and stored at our expense and under our supervision at Waynesville, Raleigh, Asheville, Greensboro and Hickory. The cost of storage and transportation will be returned to us upon delivery of the eggs. We also located storage at Raleigh and Waynesville for other War Food Administration purchases.

Another valuable outlet for eggs was the dehydration plant at Wilkesboro, where it was necessary to train and to furnish supervision for two shifts of forty-five workers. This plant has handled from 800 to 1,000 cases of eggs per day during the surplus producing period and has stored a large supply for operation during our deficit producing period. A method of conserving eggs which otherwise would have been lost was employed and has saved at least 150 pounds of egg meat per day. Two full-time resident samplers are stationed at this plant. We are working with another firm which plans to operate a large egg-breaking plant in 1945.

Approximately a half-million dollars in income was added to North Carolina producers during our deficit producing period, when we were able after many conferences in Atlanta and Washington to get a discriminatory ceiling price adjusted. Egg ceiling prices were based on grade and size. Since these ceiling prices required interpretation, we prepared a simplified table, which we mailed to 920 interested people. We also held seven meetings, with an attendance of almost two hundred, to explain how to interpret these ceiling prices in relation to grade.

The net results of these efforts were that the price of eggs was stabilized for the State at approximately twenty-eight cents for spring eggs with a yearly average price of 36.3 cents, the whole industry was assisted in meeting wartime conditions, expanded, made steady progress and did a fine job for North Carolina producers. A steady increase in the use of graded eggs by consumers in addition to the inspection of government purchases increased our inspection from three million dozens in the preceding biennium to 5,988,000 dozens. We trained fifty-five new graders and canders to help handle this volume.

There was a critical shortage of materials for egg crates; consequently, materials could be obtained only by securing priorities from the War Production Board. We arranged with the Carolina Container Company at High Point and the Durham Container Company, Durham, to make approximately twenty-five thousand fiber cases, which made a real contribution toward

relieving the shortage. Tops for second-hand cases, both wood and fiber were secured for several firms.

The enforcement of the law relating to cold-storage eggs, which requires that they be sold as such, was continued and compliance was generally satisfactory.

SURPLUS COMMODITIES DISTRIBUTION

This division acted as agent for the Department of Education and in cooperation with local superintendents of schools in receiving and distributing surplus commodities to the schools in North Carolina. Shipments were received from Maine, New Hampshire, Rhode Island, New York, Pennsylvania, Oklahoma, Texas, Florida, Georgia, Virginia, North Carolina and other states. Distribution of these commodities was made in ninety-six counties of the State. The commodities distributed were: 25,616 cases of grapefruit juice; 11,426 cases of evaporated milk; 5,400 bags of carrots (50 lbs. each); 4,120 bags of beets (50 lbs. each); 14,245 bags of Irish potatoes (100 lbs. each); 9,998 bags of cabbage (50 lbs. each); 4,340 bushels of spinach; 14,405 cases of eggs (30 doz. per case); and, in addition, 9,555 cases of eggs were stored for distribution at some later time.

MARKET NEWS

Our Market News Service, working in cooperation with the War Food Administration, provides accurate daily news coverage on price, demand and movement of farm products at leading markets in the State and at terminal markets. In the preparation and distribution of this information, this office is part of a national system which links together principal terminal markets and temporary seasonal offices in producing areas by means of more than eight thousand miles of leased telegraph wires. Market news reporters collect and distribute market information over these leased wires and by commercial telegraph, telephone and mail. Seasonal offices located in Chadbourn for strawberries, Washington for potatoes and Hamlet for peaches and watermelons issue daily mimeographed market reports in cooperation with the U. S. Department of Agriculture.

The Raleigh office prepares a daily report in the form of a release covering farm products. Nine North Carolina radio stations broadcast this release regularly. In addition to these nine stations, six others broadcast a special daily sales report

during the tobacco sales season. While not offering regular radio market news programs, practically all of the radio stations in North Carolina use from time to time some of the material prepared by this office of special interest to their listeners.

The Market News Service distributes through the press the Farm Market Summary, which is released at eleven o'clock a. m. daily for the local afternoon newspapers and to the United and Associated Press for other afternoon newspapers; the Livestock Summary and the Fruit and Vegetable Summary, released at one o'clock p. m. daily to the local morning newspaper and to the Associated Press for distribution to other morning newspapers; and, from time to time, special releases, one of which is the daily release during the fruit and vegetable season in Western North Carolina, carried by the United Press to newspapers serving that area.

Regular mimeographed reports, based on information received from the principal North Carolina markets and by leased-wire service, are prepared and issued to producers and handlers who have indicated they wish the service. These reports are issued on poultry and eggs, cattle, hogs, sheep and lambs, tobacco, sweet potatoes, apples, peanuts and Christmas greens. Weekly summaries are also prepared covering many of these commodities. We also issue monthly a milk price report, which not only furnishes price information but also contributes to the maintenance of a high standard of quality by reporting the class of the product, which is based on butter-fat content. In addition, special reports are released when unusual market conditions arise. We receive more than three thousand telephone calls yearly, requesting special market information. Also, in response to requests, special daily wires are prepared for producers and handlers, giving information on any farm product. The cost of these telephone calls and of the telegrams sent in response is borne by those requesting the information. Our reports generally quote prices based on Federal standards, which encourages the use of these standards in preparing farm products for market and gives uniform price quotations.

War regulations covering price, supply and movement of farm products while placing additional responsibility on the Market News Service during this biennium have also afforded a greater opportunity for service. Prices fluctuate in response to these regulations as well as to the economic factors of supply and demand. Day-to-day changes in market conditions often

mean the difference between profit and loss to the producer. An officer of a leading press association recently said: "Market News is a must with us. Newspapers, radio stations and, of course, readers and listeners would not let us drop this coverage."

COOPERATIVES

Eight cooperatives have been given assistance in perfecting their organizations, including writing their charters, by-laws and marketing agreements. We assisted these new cooperatives and many of the old ones with respect to sound operation and the proper way to secure tax exemption by aiding them in the preparation of reports filed with the Bureau of Internal Revenue. Recent Federal tax legislation makes it necessary for us to continue this assistance. Cooperatives file regular financial reports with the Department, as required by law, and the information furnished in these reports enables us to render constructive supervision.

PERSONNEL

Unusual demands during the biennium have tested the ingenuity and proved the ability of our personnel to cope with situations as they arise—in addition to performing their regular duties. It is with pride that I report that careful selection of personnel of outstanding ability, training and practical experience has paid dividends to North Carolina agriculture. I wish to thank these men and women for their many contributions of extra time, thought and energy in their various specialties and for entering gladly into additional service in emergencies.

ACKNOWLEDGMENTS

It has been a pleasure to cooperate heartily with branches of the U. S. Department of Agriculture, with which we have operating agreements; with the Extension Service and various departments of State College and with other Federal and State agencies. In particular, we should like to express our appreciation for the fine assistance given us from time to time by the county agents and vocational agricultural teachers.

PUBLICATIONS DIVISION

THOMPSON GREENWOOD

This division in the 1942-44 biennium expanded its usual services and organized new activities designed to place the State Department of Agriculture on an even higher rung on the public opinion ladder than the high niche carved out for it by the previous public relations directors.

The Publications Division has endeavored at all times to serve the other divisions and to work with them as closely as possible, cooperating with them on any project needing the assistance of public relations work.

A representative of this division has contacted personally 65 newspapers in the interests of the activities being carried on by the various divisions and has appeared on 29 radio stations in the State in the furtherance of the work of the Department. While it is true that most of these personal public relations visits were made in the interest of the sheep rehabilitation project being carried for the State by the Markets Division, many of them were concerned with other projects such as those related to white-fringed beetle control, credit unions, weights and measures, test farms, capon work, and vegetable auction markets activities.

The Publications Division has attempted during the past two years to take the position that this division is an important part of all other divisions in the Department, standing at their call at all times.

Since June 30, 1942, the circulation of the Agricultural Review has increased from 30,000 subscribers to more than 70,000.

In this biennium, the division has had a representative on over 200 different radio programs, most of them over Raleigh's 50,000-watt station, WPTF. A number of broadcasts have also been made over the Tobacco Network, a group of stations which includes WRAL in Raleigh, Fayetteville, Goldsboro, Wilson, Greenville, and New Bern. The Publications Division has received as high as 100 pieces of mail in a single day as a result of these radio programs.



THOMPSON GREENWOOD

Agricultural Review

Published Twice a Month by the North Carolina Department of Agriculture

KERR SCOTT, Commissioner

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D. S. COLTRANE, Assistant

VOLUME XV

RALEIGH, N. C., MAY 15, 1944

POTATOES MOVE

Randal B. Etheridge, head of Markets division of the State Department of Agriculture, was largely responsible for the recent movement of approximately 80 loads of Irish potatoes from mountain counties of North Carolina.

Etheridge said that efforts on part of the Department's marketing specialists to move the plus of the 1943 crop from the Asheville-North Wilkesboro area resulted in the establishment of a plan by the Commodity Credit Corporation to purchase all potatoes in this section, grading S. Number 1.

Guy W. Capps, of Creeds, Va., is in charge of the purchase program for CCC, according to Etheridge, and the potatoes were bought at a set price of \$2.20 per hundred pounds on the car.

The State Department of Agriculture had several inspectors in the area for some time. Etheridge asserted that farmers growing potatoes were assisted by inspectors in grading, packing and loading their product.

The locations from which potatoes were shipped and the number of cars from each are as follows: Franklin, 4; Sylva, 6; Hayesville, 10; Asheville, 5; Hendersonville, 4; Brevard, 3; Marshall, 2; Burnsville, 2; Spruce Pine, 30; North Wilkesboro, 5; West Jefferson, 7.

HOME AGAIN



DR. I. E. MILES

After losing to the armed services approximately 50 members of its personnel, including a dozen specialists and division heads, the State Department of Agriculture had a man returned recently. Lt. Col. I. E. Miles, above, who entered the Army in January 1941, was released because of a curtailment in the administrative staff of the Allied Military Government setup.

IN THE BLUE RIDGE MOUNTAINS . . .



Here are some scenes of the new 425-acre livestock test farm which the State Department of Agriculture recently purchased in Ashe County for \$24,000. Upper left photo shows the eight-room house which will be used by W. M. Transou, resident manager, who is pictured, lower left, examining blooms in the 17-acre apple orchard. Right, above, is a panoramic view of the broad meadow where much of the grain will be grown, and at lower right is shown the entrance to the grounds.

FEWER CHICKS

Commercial hatchery production of chicks for the first three months of this year was 12,900,000 as compared with 14,762,000 for these months in 1943, the Statistics division of the State Department of Agriculture reports.

Although the number of hatchery chicks produced in March, estimated at 6,800,000 was 385,000 more than the figure for March of last year, the gain was not sufficient to offset the low hatcheries of January and February, according to the report.

In anticipation of the usual heavy demand for March chicks, however, hatcheries set approximately 9,954,000 eggs during this month as compared with 9,231,000 for the same month in 1943.

"The March gain in number of eggs set brought the total for the year to date nearly to the 1943 level. Eggs set during the first quarter of this year were estimated at 20,624,000 as compared with 20,718,000 for January through March of last year," declared J. J. Morgan, Statistics division official.

Morgan said that hatcherymen expect a sharp drop in output of chicks during April and May—as compared with last season.

A special Department survey of hatchery operations for the

(Continued on page 2)

LEADS THE



D. R. GRAHAM

Popularity of credit in North Carolina is reflected more now than ever before in the formation of new units in the State. Ten unions were organized since January within the state, according to D. R. Graham, director of the Credit Union Division of the Department of Agriculture. There are now 195 state-wide units and 11 under federal charters, or 186 units. The ten thousand local credit unions in the United States.

The State chartered units have 1,000,000 members, with one-half and one-third dollars capitalization.

These and many other largely taken it away from the original conception." In the country where there was no credit, the unions have provided credit for rural people who have access to regular banking agencies. The idea was set up by the Department of Agriculture in 1935 as a local unit.

Breakdown of the now functioning shows away from the original the unions have increased the 160 total only 17 a rural community in North Carolina. There are 22 units, making 3 organizations. The others are distributed as follows:

(Continued on page 2)

The division for the past several months has given the United Press, the Associated Press, the State Association of Afternoon Newspapers, and the two Raleigh papers, an average of three stories each week day, or 18 stories each week. These were subsequently arranged for distribution to the weekly newspapers of the State.

Probably the most ambitious publication project ever attempted by the Department, the 128-page, colorful *Favorite Recipes of North Carolina* was carried out under the supervision of this division. Printed in Milwaukee, Wis., by the E. F. Schmidt Co., the book contained 16 four-color pages and scores of other pictures of mouth-watering dairy recipes. *Favorite Recipes* was sponsored by the Department and by the N. C. Dairy Products Association. A total of 20,000 copies were printed in the first order.

Within the two-year period, the regular publications of the Department and numerous folders were printed under the supervision of this division.

SEED LABORATORY

W. H. DARST

The Seed Laboratory is maintained primarily to aid in the enforcement of the Seed Law. However, a large part of the work is devoted to analyzing samples of agricultural and vegetable seeds for purity and germination that are not directly involved in law enforcement.

Samples of seed received by the laboratory for analysis are classified and recorded as "official" and "service" samples. The official samples are those drawn by authorized seed inspectors from "lots" of seed on sale, in the enforcement of the Seed Law. The service samples are those sent to the laboratory by farmers or seeds-men for the purpose of obtaining the analysis necessary for properly labeling seed to be sold, or for information concerning the quality of seed to be purchased.

WORK LOAD

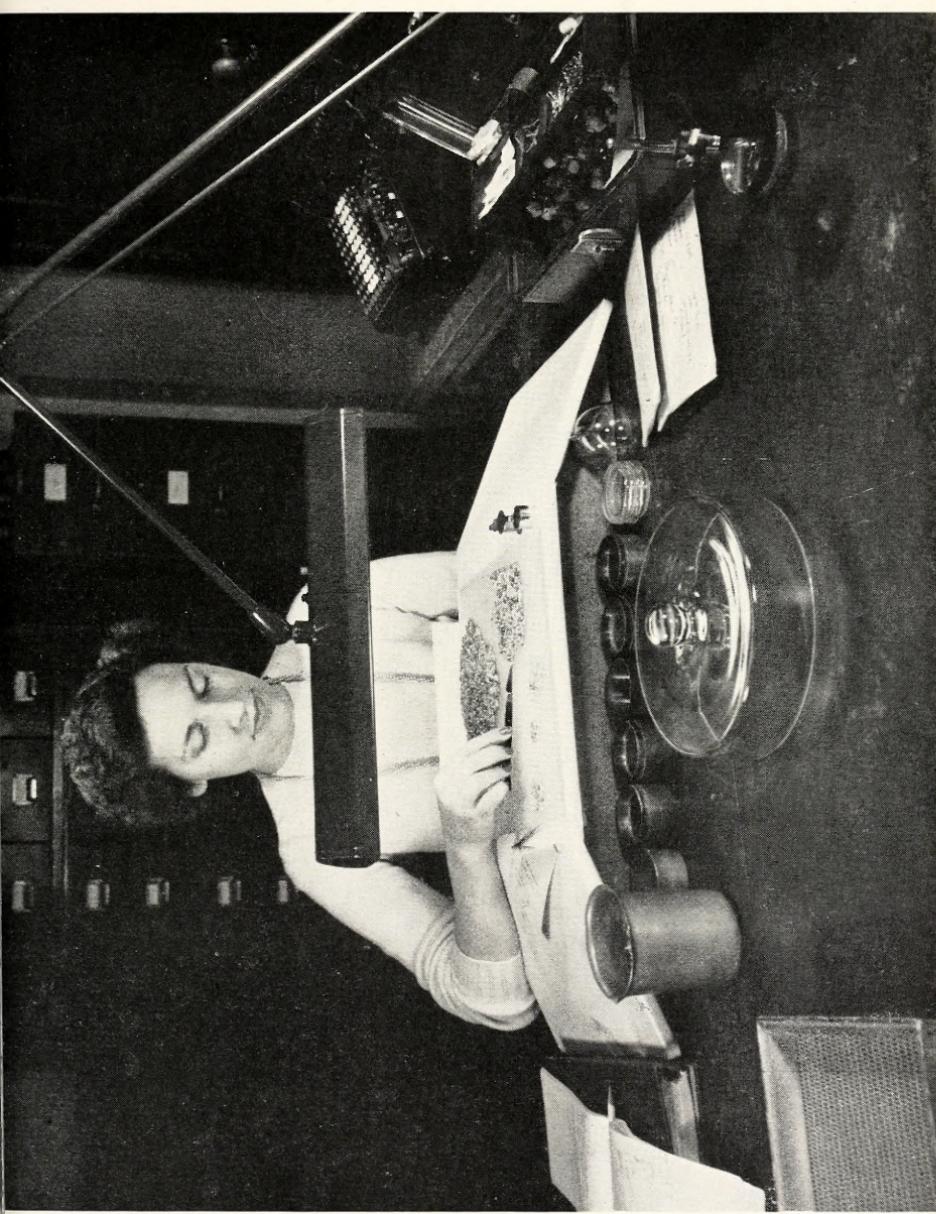
From July 1, 1942, to June 30, 1944, the Seed Laboratory analyzed a total of 24,968 samples of seed. Of this number 21,929 were "service" samples and 3,039 "official" samples drawn by seed inspectors from seed on sale in the State.

Other activities of the Seed Laboratory consisted of advising as to the tag or label requirements for seed to be sold within and without the State; assisting with the administration of the provisions of the Seed Law concerning hybrid seed corn for North Carolina; cooperating with the Federal control agencies in the enforcement of the Federal Seed Act; and in the identification of crop varieties, weeds, plants and seeds.

During the last year of the biennium, there was more than 50 per cent turnover in the personnel of the Seed Laboratory. This loss was not fully replaced by the end of the biennium. Even though the laboratory was short of qualified seed analysts, the work was handled with apparent satisfaction to all concerned.



W. H. DARST



Analyzing a sample of Abruzzi Rye for Compliance with the Seed Law.

IMPROVEMENT

During the last year of the biennium, plans were formulated to improve the laboratory in qualified personnel and in standarized equipment and procedure.

The procedure in seed analysis has been modified so as to conform with the latest rules and regulations adopted by the Official Seed Analysts of North America. The working equipment has been rearranged for more efficiency and comfort to the analysts. The seed sample storage files were increased and rearranged. The "modified paper towel method" devised by the Geneva, New York Seed Laboratory, for the germination of large legume seeds, has been provided. The germination of peanuts, cow peas and soybeans should be more satisfactory under this new method.

BETTER SEEDS FOR NORTH CAROLINA

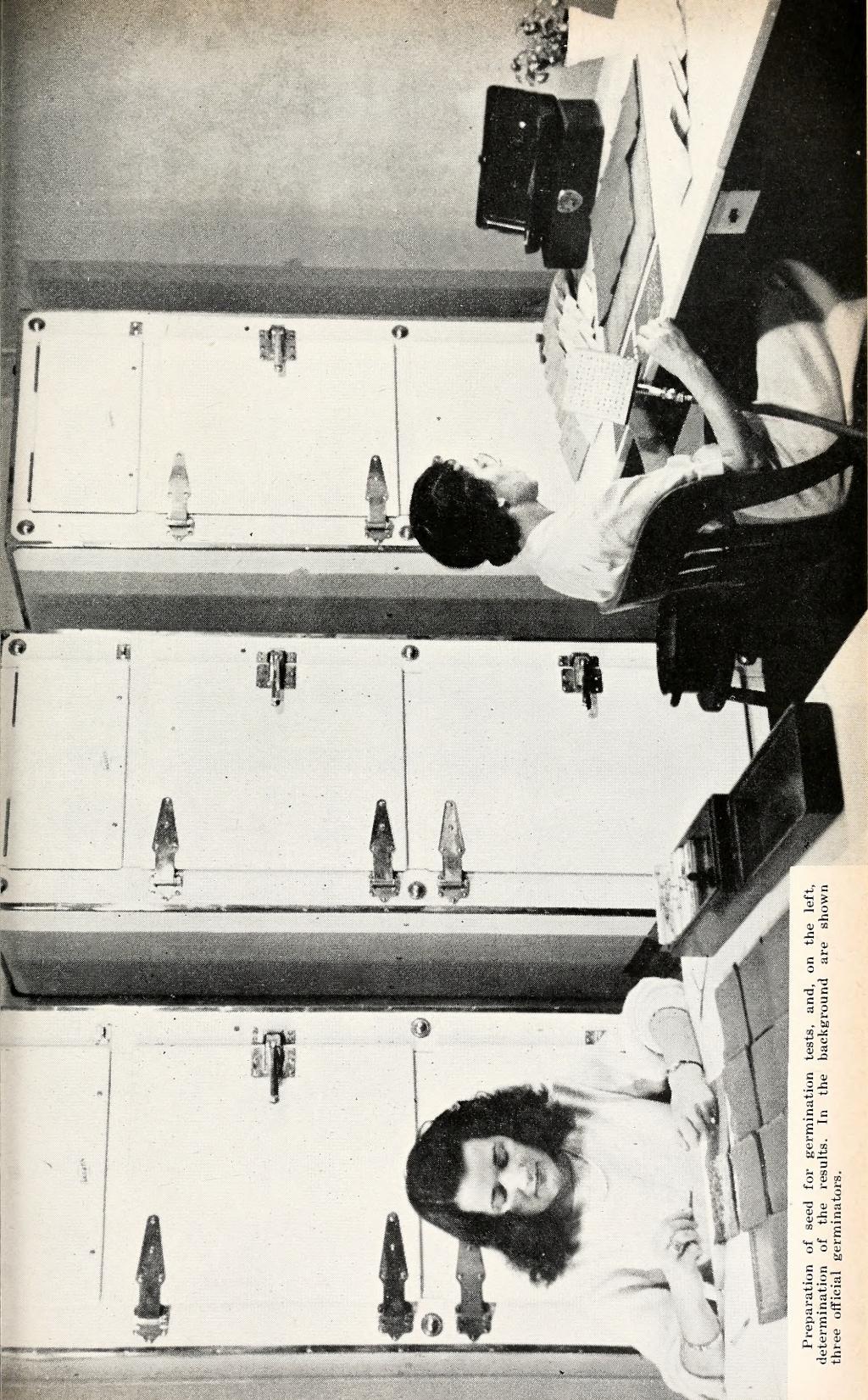
In cooperation with the Markets Division of the Department of Agriculture, the program for "Better Seeds for North Carolina" was continued. Further improvement in the processing of seed has been made as indicated by the higher purity and lower noxious weed seed content of seed samples received and analyzed by the laboratory. The following tables show the improvement in quality or grade and dodder seed content in lespedeza seed for the crop year 1943 compared to 1942 and 1938.

IMPROVEMENT IN QUALITY OF LESPEDEZA SEED

Expressed in Percentage of Crop**

Grade	Korean Lespedeza			Kobe Lespedeza		
	1943	1942	1938	1943	1942	1938
N. C. Extra 1*	19.30%	15.80%	13.70%	43.38%	32.40%	21.40%
N. C. Grade 1	23.50%	35.00%	15.10%	1.89%	21.30%	12.00%
N. C. Grade 2	27.27%	23.10%	20.00%	33.05%	26.70%	26.40%
N. C. Grade 3	17.48%	16.40%	36.70%	12.39%	11.10%	30.70%
Sale prohibited	12.45%	10.10%	14.20%	9.29%	8.40%	9.30%

*Grade "N. C. Extra 1" must be "Dodder free" otherwise same as N. C. Grade 1.



Preparation of seed for germination tests, and, on the left, determination of the results. In the background are shown three official germinators.

REDUCTION OF DODDER IN LESPEDEZA SEED

Expressed in Percentage of Crop**

Dodder per pound in Lespedeza Seed	Korean 1943	Lespedeza 1942	Seed 1938	Kobe 1943	Lespedeza 1942	Seed 1938
Dodder free -----	35.39%	22.82%	21.07%	90.20%	56.42%	32.29%
90 or less -----	81.81%	74.49%	43.62%	98.87%	94.42%	72.45%
More than 90 -----	18.18%	25.40%	56.37%	0.75%	5.57%	27.62%
More than 200 -----	17.93%	14.46%	43.62%	0.37%	3.27%	18.28%
More than 240 -----	14.67%	10.61%	43.13%	0.37%	2.95%	18.28%
More than 400 -----	3.20%	5.14%	33.82%	0.37%	1.96%	9.33%
More than 500 -----	2.66%	3.85%	29.90%	0.37%	1.31%	8.56%
More than 1,000 -----	1.09%	1.92%	18.13%	0.37%	0.65%	2.33%

**Based on samples analyzed by the N .C. Seed Laboratory.

As a result of the better cleaning of lespedeza seed for market, the prohibited amount of dodder seed was reduced in 1943 from 2,000 to 1,000 per pound of crop seed.

The amount of dodder seed permitted in crop seed by the North Carolina Seed Law is still too high, in fact more than four times the amount permitted in most other Southern States. The table entitled "Reduction in Dodder in Lespedeza Seed" indicates that the prohibited amount of dodder in crop seed can be further reduced, and in line with the laws of most Southern States.

VIOLATIONS

During the biennium, 152 "Stop Sale" orders were issued on lots of seed for sale, found to be in violation of the State Seed Law. The most common violations were, first, selling seed without the official North Carolina seed analysis tag; second, seed mislabeled as to the information required; third, seed of extremely poor quality; fourth, seed containing more than the permitted number of noxious weed seeds; and fifth, selling seed without a license or inspection stamps.

County court proceedings were instituted in three counties where seed was found flagrantly violating the State Seed Law.

SOIL TESTING DIVISION

I. E. MILES

"But other fell into good ground and brought forth fruit, some one hundred fold, some sixty fold, some thirty fold."

The biennial period ending June 30, 1944, has experienced much of the stress and strain of agriculture under the struggle of global warfare. Maximum production of foods, feeds, and oil crops have never been more urgently needed in the history of the country and yet many of the essential tools of production were only available in limited quantities. This was true of fertilizers which are very essential for maximum production on soils. It was even more important than usual that the farmer properly fertilize his crops.

The coming of the war found the Soil Testing Division still somewhat in the formative stage. Several members of the staff were called into the armed services and some of them could not be replaced. All of this naturally served to retard the progress of the work. Very few major changes have been made, but material progress has been made along certain lines. The work has been tied directly to that of the Experiment Station by having the director as a joint employee of the two agencies. This serves to create a better understanding of the entire program and will further stimulate research work in this field. With the cessation of hostilities, the division staff should again resume work in a normal manner. There should be a very material increase in the research work done in this field. It is a relatively new phase of work and needs a great deal of research work to support it. It has a great future if properly managed.

There has recently been a definite tendency toward more livestock in the State. This was sorely needed in order to balance our agricultural program. With the coming of more livestock, there had to be more feed produced. As a result there has been a greater interest taken in pasture building and pasture improvement than at any time in the history of the State. Furthermore, a tremendous interest has been taken in alfalfa pro-



I. E. MILES

duction and this crop is exacting in its soil requirements. This division has been able to work very closely with both the development of the pastures and in preparation for the growth of alfalfa.

LABORATORY WORK

There have been some changes made in the technique used in the laboratory. The principal change, however, is in the extraction solution. The present extracting solution is a .05 N Hydrochloric Acid. By using this solution, larger amounts of potassium and phosphorous are extracted than formerly and consequently the quantities of these plant food elements found are more easily correlated with crop responses. The tests made on the soil vary somewhat with the situation at hand. All soils are examined in detail as to their physical properties and internal drainage. If vegetables are to be grown, and it is an organic soil, tests are made for nitrates, ammonia, aluminum, manganese, phosphorus, potassium, calcium, magnesium, degree of acidity, and organic matter. On greenhouse soils it is sometimes necessary to determine the amount of total soluble salts present. There are some localized soil problems near the coast that have large concentrations of table salt (NaCl). Consequently, sometimes it is necessary to make chloride determinations. Occasionally total exchange capacity is determined in an effort to explain some problem. As a general rule, however, the tests listed above for vegetables on organic soils are made on all soils with the exception of the tests for ammonia, nitrates, aluminum, and manganese.

EDUCATION

This is a phase of the work that will never be completed. A great many people still do not properly take the samples. The importance of proper sampling cannot be over-emphasized. However good all other phases of the work might be, the entire work will be of no avail if the sample does not represent the field. A great deal of time is spent in visiting, consulting, and advising with people and demonstrating the collecting of soil samples. At the present, a research project is underway on soil sampling but until that work is completed, the best methods known should be used. As research work progresses on sampling as well as on all other phases of the work, additional information will come

to hand and in turn must be passed on to those who are interested in using the services.

Many people have never completely understood the soil testing program. In many instances it has been offered as a panacea for all our plant nutrition problems. In such instances the program was oversold. These people must be informed as to the limitation of the soil testing services. On the other hand, there are others who do not properly appreciate what can be and is being done by the division. The latter situation is by far the more difficult to correct, because in most instances this group does not realize the fallacy of its practices. Many farmers are securing only average yields, or less, when enough energy and fertilizer are being expended to produce maximum yields. Numerous data from the soil testing laboratory have shown that there was a distinct deficiency of one plant food and an abundance of another. Yet that farmer was consistently applying almost 100% more of the plant food present in abundance than the one which actually was the limiting factor in production.

Much time has been spent in visiting with farmers and farm leaders, both individually and collectively, in an effort to inform them properly as to the limitations and capabilities of the service.

FOLLOW-UP WORK

It is always very necessary that the recommendations be followed through by an agronomist. This gives the agronomist an opportunity to study the results of his work first hand. It also serves to tie the agronomist to the soil itself and thus keep him intimately in contact with the farmer's problems. Furthermore, the visit affords an opportunity to call attention to plant food deficiency symptoms and fallacies in practices which might be observed while there. Most farmers genuinely appreciate these visits.

With the shortage of personnel and gasoline, this phase of the work was somewhat curtailed, but it is anticipated that these limitations will soon pass and that more follow-up work can be done.

TROUBLE SHOOTING

This phase of the work continues to demand considerable time. The crop fails to produce and the farmer wants to know

the reason. It may be caused by any one of a great many things or a combination of several. Sometimes it is a physical problem and can be detected on the site. More often, the observations have to be supported by an analysis of the soil. Whatever the cause, it is usually located. In many instances, other divisions or agencies are called upon to assist with the problem.

The problem may be small or great, but the main thing is the farmer has recognized it and he wants to correct it. This man wants to learn and he should be helped.

Some of the problems encountered are shown in the accompanying pictures:



This tobacco plant is suffering from the lack of calcium (dolomitic limestone is made up of both calcium and magnesium).



The soybeans where the man is standing are starving for the want of magnesium. It is often called sand drown.



The soil in the middle of the picture is extremely acid and less acid on the sides.



The soil in the foreground was overlimed while that in the background was limed properly. Note the difference in growth of corn.



The soybeans on the right are starving for the lack of potassium while on left they are not.



The tobacco on the left was suffering for the lack of phosphorus while on the right there is ample phosphorus present.



This land was very deficient in calcium and magnesium. The outside of the field was limed but the center was not.

Plant tissue testing is another very interesting and helpful phase of the work. This frequently assists one to explain a problem and it can be done in the field. It is also often used as supplementary information to soil testing.



The corn plants are being tested for plant food deficiencies.

ACKNOWLEDGMENTS

The work has been supervised by Dr. J. Fielding Reed for the major portion of the time for the past two years. It is felt that he has done an excellent job even with all of the restrictions and limitations placed upon him incident to the war.

The Experiment Station has been very much interested in the division and has worked very closely with it. Therefore, it has contributed liberally to the soil testing program.

The U. S. Department of Agriculture through the Soil Conservation Service has lent invaluable assistance.

To all these and all others who have contributed to the program in any way, we are deeply grateful.

DIVISION OF STATISTICS

FRANK PARKER

The past biennium (July 1, 1942, to June 30, 1944) proved to be the best period in the twenty-five years' existence of the Statistical Division. This is true in spite of the heavy losses of personnel during the two years. The primary helpful factor was increased funds for supplying better services. This was most fortunate in view of the war production program planning and related emergency needs. Thus the reasons outlined for the Legislative increases two years ago have been more than justified.

Increasingly for many years have come evidences of uses of statistical information, and particularly so in recent years under the farm program operations. Because of the excellent county statistics available, easier and more equitable allotments and county programs were provided with the least expense and annoyance. New needs are constantly arising. The fine co-operation from farmers and county groups proves that the results are quite satisfactory. The statistical services have become taken for granted as shown by the fact that on any agricultural leader's desk may be found a copy of "*Agricultural Statistics*," to which reference is frequently made.



FRANK PARKER



The tremendous turnover in the Department's personnel during the past two years is well illustrated by this picture. All except two of these employees have gone to other positions since this photo was made in the summer of 1942.

The principal features of the Statistical Division include fiscal and administrative; schedules and reports; releases and publications; State Acts compliance; and field studies. Broken down into services these are the farm census; general and regular reports; special reports; the report releases; publications; specialized or individual services; aiding War Board and farm machinery rationing; threshers' records; research; and emergency services. More in particular these are:

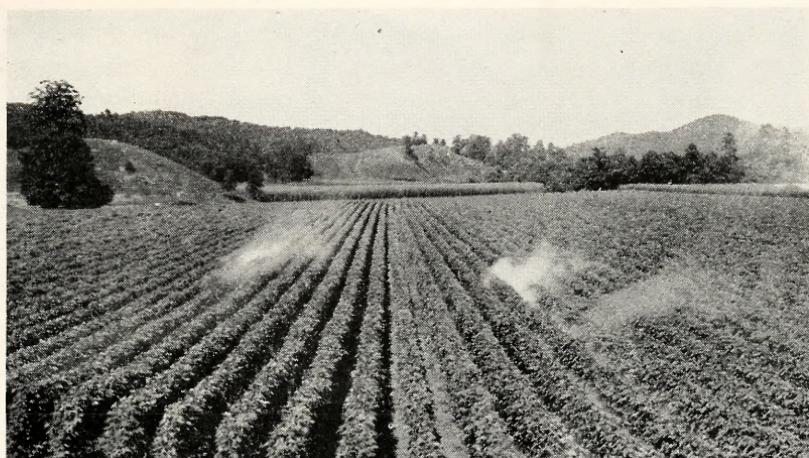
I. FARM CENSUS

This is considered first for the simple reason that it is the foundation of the whole county service program. Information from about 280,000 farms is secured each year. The 1944 enumeration, covering 1943 crops, is the most complete survey of any thus far secured. The farm census has developed into a most reliable source of county facts after twenty-seven years' experience. It has really been the foundation of the A.A.A. allotments, war production programs, and farm machinery rationing. All counties and all townships participate.

Individual farmers throughout the State have gained definite benefits in addition to their committees and county organiza-



Over 30,000 voluntary reporters provide the working material for developing the 370 yearly reports.



A Henderson County field that cost \$9,000 to produce \$14,000 worth of lima beans. They were on 7 feet high wired trellises. The statistician must keep in touch with seasonal growing conditions in order to interpret reports from growers.

tions. Case histories are too numerous to be mentioned here, but the following are typical of the many definite examples known: The Guilford County manager stated in August, 1944, that the farm census alone had this year yielded that county a return of many-fold profits on its yearly investment to this work. As Mr. Albritton, in Duplin County, stated, "My use of the crop reporting information enabled me to save or to make from \$500 to \$4,000 yearly above what I normally would have been able to do without this information." The county agent in Rowan County has made extensive use of this information, even for individual farms.

In addition to the direct benefits, the county and State returns are numerous—such as investment houses which use the county statistics for knowing best where to buy bonds and to loan funds. The Experimental Statistical Laboratory for the South was secured for North Carolina largely because of the excellent agricultural statistics available. The same is now probable for a Southeastern Weather Laboratory at State College. Literally, everyone is finding that statistics is the foundation for constructive planning and development. All agricultural agencies which operate in North Carolina count on this information and would not know how to get along without it. The director of the Experiment Station said that a principal deciding factor in his coming to North Carolina was the excellent agricultural statistics available here.



The line of demarcation between crop estimates and marketing occurs when the farmer sells his product. This illustrates the case. The farmer represents one side and the buyer the other. This is a 1944 Beaufort County scene. German prisoners helped (in background).

United States Census Compliments North Carolina

The United States Census Bureau rates North Carolina's agricultural statistics equal to those of any State. It has adopted for the 1945 census our own farm survey type of enumeration book and sheets on the ground that these save greatly in paper and printing costs, editing and checking, filing space, probable omissions and errors, besides otherwise providing more efficient results.

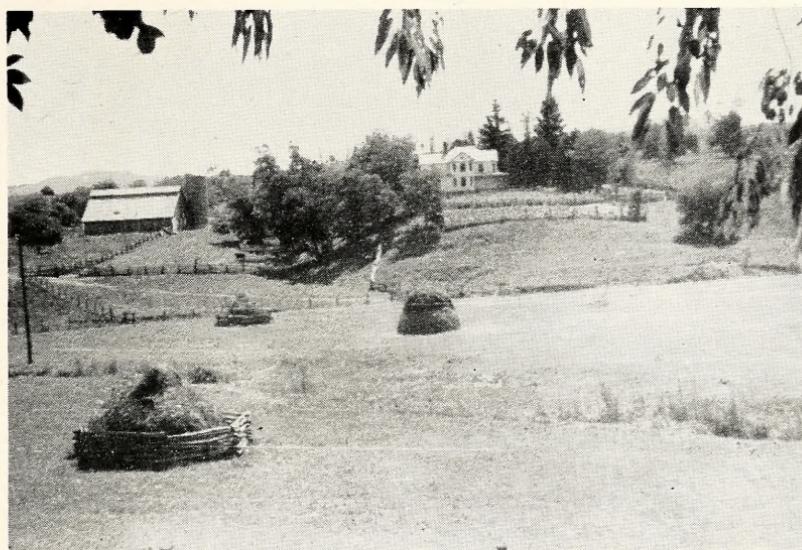
II. GENERAL REPORTS

The general reports are those which go out each month pertaining to all crops and livestock and provide monthly seasonal trends or follow-up information bearing on acres, condition, yields, prices, production, values, etc. Tobacco production estimates, grain yields, and condition of crops illustrate the type of information available from the general report. The most significant feature is the variation of the month-to-month condition of crops as the season progresses.

III. SPECIAL REPORTS

Special reports include the somewhat unusual features, such as seasonal reports on cotton prospects, truck crops, legumes, peanuts, dairy and poultry products, farm labor, wages, land

values, and prices received and paid by farmers for farm commodities (which are the bases of computing farm parity prices). These occur at irregular intervals through the year and make up a total of something over 160 compilations, or about an average of three per week. The truck crop work alone requires one man's time as well as that of a clerk. Commercial truck growers throughout the eastern counties count heavily on this information in planning for their crops.



Monthly field investigations of actual farm conditions are required to keep in touch with developments in ALL parts of the state. This scene is in Ashe County, where livestock and pasturage predominate.

IV. FIELD INVESTIGATIONS

Field investigations are necessary to keep familiar with the actual changing conditions over the State so as to interpret the reports received from farmers. One might as well try to farm without visiting his fields as to try to render statistical services without field investigations.

V. PRINTED PUBLICATIONS

Printed publications include the annual "Agricultural Statistics" and various other special publications, such as the farm census size groups, special livestock issues, and educational sheets.

The "Agricultural Statistics" is accepted as the official source of crop and livestock estimates for North Carolina. North Carolina is recognized throughout the United States as providing one of the two best annual publications—both in attractiveness and completeness of information. Wisconsin is the other State. Thus the agricultural leaders of this State have been able to plan and discuss programs intelligently—just as a good inventory provides for any business study—it is good working material.

An off-hand appraisal may make the printed publications look like a minor matter. As a matter of fact, these require the full time of two persons to prepare the information for publishing after the original reports are finished.

VI. SPECIALIZED OR INDIVIDUAL SERVICES

The specialized or individual services include answers to particular inquiries, information for talks or speeches, special research efforts, and individual county studies. Most of these requests can be supplied by copies of current publications.

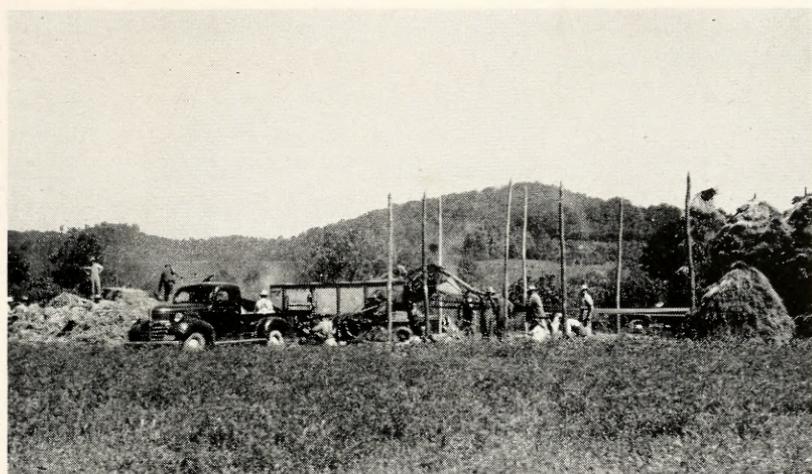
Another item is the mimeograph service provided to the State Department of Agriculture. Actual figures show that of the 1,051 stencils run during the past year, half were for divisions other than the Statistical. Considerably over one-half million sheets of paper were mimeographed.

VII. THE WAR BOARD AND MACHINERY RATIONING SERVICES

The statistician was the one required member of three for the original state committee as started in 1932-33. The same requirement was made for the State War Board. Increasingly the other members or agencies represented on the War Board came to realize that statistics are really the foundation of program planning. The same proved to be true of the farm machinery rationing committee and the farm gas allocation committee when county allotments were based on crop acreages and numbers of tractors.

VIII. THRESHERS' RECORDS

These represent more than 90,000 individual farm reports, covering nine different crops, each year. These records are secured under the provision of the State Threshing Act and the results give county harvest figures.



While combines are now harvesting most small grain, threshing machines are still important if more expensive and wasteful. The statistician must forecast the final outturn of the crop; consequently he handles operators' records of threshing operations.

IX. RESEARCH

While the heavy load of current statistical information being gathered and interpreted permits of little time for research work, our office has much potential undeveloped information. After the data are collected for crop acreages, other latent values still remain. The statistical by-products frequently are worth more than the original facts. Research is a means of improving statistical methods.

COOPERATIVE RELATIONS

From a careful study of contributions and performance for the fiscal year 1943-44, it is found that the total appropriations to the Statistical Division by the State and Federal Departments of Agriculture amounted to \$60,719—or an equivalent of \$91,670 including allowances for room rent and the franked mail, both of which are true contributions. Of this equivalent total, the State contributed \$35,674 or 38.9 per cent. This is an excellent cooperative contribution or investment inasmuch as the State and county agencies receive practically all of the credit and benefits.

For each dollar invested by the State, two or three more are added from Federal sources for statistical work, which is sig-

nificant of the importance of North Carolina agriculture from a national viewpoint.

FEDERAL CONTRIBUTIONS

The Federal contribution expenditure totaling \$38,245 (exclusive of supplies and the franking privilege) was divided approximately as follows for the last year of the biennium:

Salaries of Federal employees	\$28,000
Stationery, including paper and envelopes furnished	3,400
Traveling expenses	1,245
Equipment furnished	635
Publications furnished from Washington	4,965

Incidentally, most of the equipment (machinery) in this office is furnished by the Washington agency, as well as office supplies and stationery.

The paper shortage has affected all agencies as well as this division, but in view of the officially recognized nature of the crop estimates services, only a slight saving in paper could be required. The present plan of making all government agencies account for each piece of franked mail is finding the Statistical Division's usages high, but nevertheless approved. It now appears that such usages in North Carolina during the past year of the biennium represented \$17,760 franked mail equivalent; the stationery totaled about ten tons.

It is noteworthy that the supervision of the Statistical Division is by four Federal professional statisticians. These men have all had many years' experience in statistical work. Of the State-paid statisticians now employed, all are new in this type of work. The demand for trained statisticians is so great that the State salaries will not hold them.

The following table shows the performance record of the Statistical Division for the past biennial period:

	July 1, 1943 to June 30, 1944	July 1, 1942 to June 30, 1943
Schedules (questionnaires) mailed	304,433	306,444
(Exclusive of Farm Census and threshers)		
Returned reports tabulated (see note * below)	70,878	75,017
Threshing records—farms reported—9 crops	91,452	65,520
Statistical reports developed (studies)	345	334
Report releases mailed (copies)	177,723	188,102
Copies of annual "AGRICULTURAL STATISTICS" mailed	9,900	10,421
Copies of "Farm Census" county summary published	7,500	7,500
Copies of sample size group research, Iredell County study, published	5,000	—
Copies of "Agricultural Situation" bulletin mailed	71,500	70,532
Mimeograph stencils run for Statistical Division	523	441
Mimeographed sheets run for Statistical Division	334,844	347,044
Mimeographed stencils run for other Divisions	528	545
Mimeographed sheets run for other Divisions	532,000	161,768
Farm Census mail, in ounces (mostly township reports)	18,100	20,000
Technical workers—professional class		
State	2	3
Federal	4	4
Statistical and other clerks		
State	10	8
Federal	7	6
Miles traveled in field investigation work (United States Department of Agriculture furnishes an official car)		
State	19,199	8,841
Federal	15,572	10,109
Approximate average year's cost per technical man—all travel		
(North Carolina and United States)	\$435	\$257
Office space provided by State—square feet	3,900	3,649
Approximate renting value per year	\$4,200	\$3,930
Historical records, 100 counties, 116 pages, being prepared for publication, 9x11½", printing cost	\$2,600	—
War purpose Farm Census research working cards (farm records)	182,000	—
Expected completeness of above work by January 1945	98%	—
Needed funds for publishing research results (condensed form), 224 pages	\$4,200	—
Pounds of scrap paper turned over to Red Cross	6,000*	0
Estimated State expenditures, including salaries	\$31,474	\$21,860
(Office rent allowance for space provided by State)	\$4,200	\$3,930
Estimated Federal expenditures, including salaries	\$38,245	—
(Estimated cost of Federal franking privilege)	\$17,760	—

*Farm Census records include approximately 324,000 farm tract reports.



FRED E. MILLER

DIVISION OF TEST FARMS

F. E. MILLER

This report will present briefly the program of work on the outlying Experiment Stations or Test Farms for the biennium ending June 30, 1944. More detailed reports from the experiments conducted at the different stations will be found in bulletins and circulars published by the North Carolina Agricultural Experiment Station, the U. S. Department of Agriculture, and the N. C. Department of Agriculture.

COOPERATION

The experimental projects and general farm crop programs are handled in cooperation with the N. C. Agricultural Experiment Station of the N. C. State College of Agriculture and Engineering of the University of North Carolina. The U. S. Department of Agriculture cooperates and aids in supporting many of the experiments. All cooperative investigations receiving Federal support are covered by formal memorandums of agreement which are signed by the executive officers of the agencies contributing toward the work. The research projects on the station farms are under the supervision of Dr. L. D. Bauer, director of the North Carolina Agricultural Experiment Station. The director of Test Farms is also in charge of the McCullers Branch Experiment Station, ten miles south of Raleigh on highway 15-A, and the Central Experiment Station, west of Raleigh and adjoining the State College lands.

NATIONAL DEFENSE

The personnel of this division has taken an active part in civilian defense. The offices at the Blackland and Upper Coastal Plain Stations have been used by the War Department as Air Craft Warning Posts.

An area on the Coastal Plain Station was selected by the War Department during the winter of 1943-44 for certain maneuvers. Groups of soldiers were camped on the station's property during this period.

RELOCATION OF STATION FARMS

The old Mountain Test Farm at Swannanoa is now the site of the Moore General Hospital. Using the funds received from the sale of this Test Farm, 287 acres of land east of the city limits of Waynesville was purchased in July, 1944, for \$45,000. This is the new Mountain Experiment Station. From this sale fund, also, 410 acres of land in Ashe County near Transou, was purchased in May, 1944, for \$24,000. This is the Upper Mountain Experiment Station. Mr. Dean W. Colvard will be located at the Mountain Station at Waynesville and will serve as assistant director in charge of both Mountain Stations. A resident superintendent will be employed at the Upper Mountain Station, who will serve under the directorship of Mr. Colvard.

The station at Waynesville will conduct investigations dealing in dairy cattle, poultry, burley tobacco, fruits and vegetables, and general field crops. The Ashe County Station's program of work will include beef cattle, sheep, burley tobacco, pastures and feed crops, apples and some vegetable crops.

The old Blackland Station at Wenona, consisting of 363 acres, has been sold for \$20,000 to Mr. A. G. Pryuser, Delray Beach, Florida. He will take possession January 2, 1945.

The new Tidewater Station was purchased in the fall of 1943 for \$27,500. This farm consists of 1,993 acres and is located in Washington County on U. S. highway No. 64, five miles east of Plymouth.

GENERAL

The stations have called off the annual farmers' Field Days for the duration. A few special meetings have been held during the past biennium such as the Small Grain Day at the Piedmont Stations and research workers conferences.

Improvement work has been carried on as far as possible. This relates to repairing and painting buildings, clearing and draining land and fencing grazing areas. Farm machinery and implements have been kept in good repair, but much new equipment is needed and will be purchased as soon as war conditions permit.

The progress report by stations will follow. The report on the different experiments gives the name of the specialist leader

and it is understood that the assistant director in charge of the station contributes to each project in addition to his regular duties as administrative officer of his respective station.

PIEDMONT STATION—STATESVILLE, N. C.

J. W. HENDRICKS, *Assistant Director in Charge and Agent, U. S. D. A.*

Station Established in 1903.

Area of Station, 233 Acres (State); 133 Acres (Federal)

Soil Type: Cecil Clay Loam.

Elevation, 950 feet above sea level.

Climatological Data for 1943:

Mean Annual Temperature, 60.0 degrees Fahrenheit.

Annual Rainfall, 41.70 inches. Total Snowfall, 6.00 inches.

GENERAL

The station renders public service through the following channels: Research activities, public meetings, demonstrations, correspondence, and the furnishing of information to the many visitors throughout the year.

During the past biennium the Annual Field Days have not been held due to wartime restrictions, however, the Small Grain Field Days have been held with excellent attendance each year.

All experiments have been revised in order to adequately meet the national agricultural defense requirements.

It has been the policy of the station to grow for increased purposes recommended strains of our leading small grains. This work has been primarily with wheat, oats and barley. The annual distribution of seeds has been approximately 2,000 bushels. The station has been unable to meet the demand for purebred seeds, and has rendered a service in bringing together farmers and buyers in supplying the demand in local communities. Small Grain distribution has been from the New England States throughout the Southeastern and Gulf States. There has also been a small amount shipped for export to South America.

Results from cotton experiments being conducted on the station indicate that there will be some excellent strains to release in the near future.

Approximately 75 to 100 bushels of Weekley's Seed Corn and an equal amount of Jarvis Golden Prolific Corn are distributed each year.

Over a period of years the station has been carrying a limited number of Poland China hogs as a source of breeding

stock, but has not been able to supply the demand. From 10 to 12 purebred rams have also been released for breeding purposes each year.

The station continues to be a source of information on agriculture for the Piedmont section, and the increasing number of visitors each year will give some idea as to how its activities are appreciated. Monthly visitors during the summer average more than 500, these coming as individuals and in groups.

AGRONOMY

*Cooperating with the N. C. Agricultural Experiment
Station and U. S. Department of Agriculture*

The Improvement of Small Grain for Grain and Forage
(G. K. Middleton and R. W. McMillan) : The Piedmont Station has been the center of the Small Grain breeding work in the State, though in the past two years this work has been divided with the McCullers Branch Station. Limited work has also been done on the Mountain Station, primarily in testing for winter-hardiness.



The final seedbed preparation and seeding small grain on the Piedmont Station.

On this station approximately $3\frac{1}{2}$ acres of land is used each year for breeding and testing work with wheat, oats and barley. These nurseries include from 8,000 to 10,000 progeny or yield test plots each year. The breeding work is centered largely around the development of smut, rust, and mildew resistant strains with good yielding ability of the crops mentioned. No new strains have been distributed in the past two years, but one leaf rust resistant wheat and one improved cold resistant oat is ready for multiplication.



Field Lelina Oats on Piedmont Station.

Oats: One selection from a cross of Lee X Winter Fulghum (No. 1083 B-1) has produced as an average for the past six years (1939-1944) 84.2 bushels of grain per acre as compared with 76.9 for Lee No. 5, 73.7 for Letoria, and 70.7 for Lelina. This is an increase over Lee No. 5 of 7.3 bushels or 13 per cent. In two years' tests in each of Guilford and Cleveland Counties it has produced 20 per cent more grain than has Lee. No. 5. This new oat is more winter-hardy than Lee. Its one worst fault is that it has shown a tendency to lodge in some tests. It will be multiplied in 1944-45 for possible release in the fall of 1945.



Ten acre field of certified Leaps Wheat on Piedmont Station.

Wheat: As an average for the past five years (1940-44) a rust-resistant selection from a cross of Malakoff X Nittany has produced at the Piedmont Station 38.1 bushels as compared with 36.1 for Nittany and 34.5 for Fulcaster. It is of the Fulcaster type and may be distributed to replace Fulcaster in areas where this variety is grown.



Sunrise Barley on Piedmont Station. This twelve acre field produced 710 bushels.

Barley: Sunrise barley continues to be the leading variety on the Piedmont Station, as measured by bushels of grain per acre. For the seven years this variety has been on test average yields of 58.6 bushels have been produced. The chief criticism of this variety has been its susceptibility to loose smut. Sunrise is resistant to mildew and is being used in crosses with Davidson and Hooded 26, both smut resistant strains previously released by the station, in an attempt to develop strains with resistance to both diseases. Selections from these crosses have been in preliminary yield trials for the past two years. Those that have shown resistance to mildew, and which have good yielding ability are being tested for susceptibility to smut.

Corn Seed Treatment (S. G. Lehman) : Corn seed treatment for disease control has been reported as profitable and is being recommended as routine practice in the corn belt. In 1943 certain cooperative regional corn seed treatment tests were initiated together data as a basis for determining whether corn seed treatment for disease control is to be recommended in the Southern States. In 1943, corn seed was assembled from seven states. A part of each lot was treated with Semesan, Jr. dust. Treated and untreated portions of each of the seven lots were planted in tests at the Piedmont Station.

Stand counts made when the plants are 8 to 10 inches tall showed that the treated seed of each lot gave a larger number of plants than untreated seed. The increase resulting from treatment of the seed of 5 of the 7 lots was large enough to be considered significant. Increases ranged from 8.8% to 23.2% for the different lots, the average of the 7 lots planted being 15%. The rows were thinned as near as possible to a uniform stand. This operation removed a large part of the increase from seed treatment but the rows from treated seed still had 4.9% more plants than rows from untreated seed. The treated seed gave a yield increase of 1.9% of ear corn.

Soil Fertility Studies (W. H. Rankin) : There were six sub-projects in this work in progress on the Piedmont Branch Station during 1943-44 (fiscal year).

1. Field A is being maintained for its historical and scientific value as a source of soil for studies that may be undertaken.
2. Date and rate of seeding small grains (discontinued June 30, 1944) :

*Early Seedings of Oats, Wheat and Barley Make
Highest Yields*

Small grains seeded after November 1, have not produced yields equal to those seeded earlier in experiments conducted during the last two years at the Piedmont Experiment Station near Statesville.

Oats seeded October 1, produced an average of 66.9 bushels per acre compared with only 34.7 bushels when seeded November 15. In seasons when severe winter killing of the small grain plants and heaving of the soil are severe, late seeded oats are reduced in both stand and yield more than earlier seeded ones.

Complete crop failures for the November 1 and November 15 seeding of oats were recorded for the 1943 crop season.

Wheat seeded October 15 has produced 27.2 bushels per acre while that seeded one month later, November 15, has produced 21 bushels or only 77% as much.

Barley seeded on October 1 has produced 39.8 bushels while seeding six weeks later it has only produced 72% as much, or 28.8 bushels per acre.

Late Seeding of Small Grain Fails to Produce Adequate Winter Cover

Furthermore, late seedings make very little fall growth to protect the soil from the impact of winter rains, and a very small root system to anchor the soil and to absorb nutrients that may be in solution; erosion and leaching may be accelerated instead of controlled.

Rate of Seeding Wheat, Oats and Barley

Wheat seeded at the rate of six pecks per acre has produced sufficient increase in yield over that produced from four pecks to justify seeding from five to six pecks per acre. Seeding at rates higher than six pecks have not increased yields of wheat.

Oats seeded in the fall at rates in excess of two bushels have not produced any larger yields.

Barley seeded at the rate of two bushels per acre has increased the grain yield over the $1\frac{1}{2}$ bushel rate, but rates higher than two bushels seem unjustified.

3. Time of applying nitrogen topdressing to small grains:

Nitrogen applications made at seeding are lost by leaching or before the plants can utilize it. In the very late application, April 15, the plants are approaching maturity and do not utilize the nitrogen. The wheat yields indicate that more efficient use of the nitrogen is made if it is applied in late winter and early spring. In development of the wheat crop the optimum time for supplying nitrogen is prior to the period of maximum growth.

4. The response of wheat to amounts of nitrogen, phosphoric acid and potash when applied as side dressers.

5. The response of wheat to nitrogen, phosphoric acid, and potash applied at seeding.

6. Amount of complete fertilizer for small grain at seeding.



Piedmont Station. A twenty-acre field of Hooded Barley No. 26.

The date for the last three experiments listed are insufficient, therefore, conclusions are not drawn from them.

Corn Hybrid Investigations (Paul H. Harvey) : During the year of 1942 approximately 3 acres were used in testing experimental hybrids. Fifty double crosses, 36 ensilage strains, and 81 top cross hybrids were tested in yield trials. In 1943, 4 acres were used in testing 123 double cross hybrids, 114 top cross hybrids, and a date-of-planting test involving 6 strains.

By way of practical results, a two-year average shows the double cross N. C. Hyb. 1016 to have averaged 63.9 bushels per acre as compared with 54.4 bushels for Jarvis Golden Prolific, an increase of 17.5 per cent for the yellow hybrid. The white hybrid, N. C. 1111, averaged 61.4 bushels as compared to 53.9 bushels for the white variety, Weekly's Improved, an increase of 12.0 per cent. In the date-of-planting test N. C. hybrid T11 produced 49.3 bushels per acre and N. C. T1 44.0 bushels as compared with the check variety of 37.5 bushels, or increases of 31.5 and 17.3 per cent respectively for the two hybrids over the check. Seed of these two latter hybrids are being produced in a rather large quantity this season (1944) by farmers in the Piedmont area.

Soybean Breeding (J. A. Rigney) : The soybean breeding project planted one regional variety test on this station in 1943. It included 25 varieties, the five leading being Volstate, Ogden, Delsoy, 89775A, and Tenn. Non Pop. Three commercial inocu-

lants and two commercial hormone dusts were also tested on the three leading varieties. The inoculants (Nitrogen, Nod-o-gen, and Urbana culture) showed no effect over the uninoculated plots even though no beans had been grown on that area for several years. The hormone dusts (Staleymone and Rootone) were dusted on the seed at planting and showed no effects at any time during the year.

Castor Bean Varieties (P. H. Kime): Varieties of Castor Beans were tested during the past two years for the purpose of determining adaptation, yield, and resistance to diseases. The above information would be helpful in case large scale production should become necessary in our war effort.

FORAGE CROPS

Cooperating with the Office of Forage Crops, U. S. D. A., and the N. C. Agricultural Experiment Station, R. L. LOVVERN and R. E. STITT

Common Vetch Adapted to North Carolina: Common vetch has made as much growth as hairy or smooth vetch when grown at the Piedmont Station. The Willamette variety has been earlier than Oregon Common or Alba and is thus better adapted for green manure on sandy soils. Seed yields of Willamette were 112 pounds per acre in 1941 and 770 pounds in 1943. Smooth vetch yielded 158 pounds in 1941 and 451 pounds in 1943.

In 1941 the yield of Smooth vetch was lowered by a 28 per cent infestation of the vetch weevil and the low seed yields of 1941 were the result of spring drought. Common vetch may be injured during the winter, however, this occurs only during mild winters when growth is extremely rapid and temperatures of 10 degrees Fahrenheit or lower follow the mild period. From 1931 to 1943, this injury was severe only during the winter of 1931-32.

Better Lespedeza: As a result of selection work by several of the State Agricultural Experiment Stations and the Division of Forage Crops and Diseases of the U.S.D.A., several new strains of annual lespedeza have been developed.

Climax, a new variety selected from Korean, is adapted as a hay variety. It has proved to be about two weeks later in maturity than Korean and should be valuable in lengthening the pasture season. Other new strains have also shown high yielding ability.

Small Grains for Fall and Winter Pasture: In experiments at the Piedmont Station carried on since 1936 rye has produced the most growth for fall and early winter grazing, and barley has produced nearly as much grazing as rye and can be grazed later in the winter and spring. It has been grazed through January without reducing the grain yield, but even fall grazing reduced the grain yield of rye. Oats has produced less growth than rye or barley and matures later in the spring.

To obtain early fall grazing the small grains were seeded in August. However, this early seeding has usually caused a severe rust injury to the wheat.

Phosphate and Lime Increase Sericea and Annual Lespedeza Yields: In an experiment at the Piedmont Station, carried on for four years, an annual application of 250 pounds of superphosphate (20 per cent P₂O₅) to sericea lespedeza has increased the acre hay yield from 1.53 to 2.04 tons. Two tons of lime per acre applied before planting the sericea yielded 1.83 tons hay when used as the only treatment. When the lime was applied to the same areas as superphosphate, the hay yield was 2.13 tons hay. It was also proved that the superphosphate should be applied at least every two years.

The sericea hay was cut at a height of 12 to 14 inches, with two cuttings each year, the first in June and the second in early August.

In a rotation of oats and annual lespedeza, Korean and Kobe varieties gave similar response to fertilizer. However, over a 3-year period, Korean yielded slightly more than Kobe. Plots receiving annual applications of phosphate and potash yielded 1.17 tons per acre as compared with 0.72 tons without fertilizer. Two tons of lime applied once every 4 years added to the fertilizer increased the yield to 1.27 tons. In the same rotation, Lee 5 oats averaged 21.2 bushels without fertilizer and 30.2 bushels with the fertilizer treatment.

FORESTRY

Cooperating with the N. C. Extension Service, R. W. GRAEBER.

Forestry Variety Work: To determine the best variety of pines in this section. In this experiment we are studying the value of forestry in connection with soil building and erosion prevention. This experiment is only thirteen years old, but we are nevertheless observing outstanding results and we are thinning for proper stand.

HORTICULTURE

Cooperating with the N. C. Agricultural Experiment Station,
M. E. GARDNER.

Raspberry Fertilization: In this experiment nutrient elements have been applied to plots of the Latham raspberry, alone and in combinations, to determine the best treatment for raspberries under Piedmont conditions. N. has been varied from 0%-8%, P from 0%-16%, and K from 0%-8%. In addition manure has been used alone, and in combination with a complete fertilizer.

Manure at the rate of 10 tons per acre has given best results, followed by the manure-complete fertilizer combination.

This experiment was discontinued as such in 1942 because sufficient data had been collected. It is planned to outline a second experiment based on the findings of the first, as soon as conditions justify.

Peach Fertilization: The crop was killed by cold weather in 1943 and severely injured in 1944.

The experiment was designed primarily to determine the effect of fertilizer combinations, with and without cover crops, on growth and production. Previous work had indicated that good production could be had by using N along under a system of clean culture followed by growth of natural cover, but the relationship of P and K was not understood.

Results indicate preference for a complete fertilizer with planted cover crop. The trees, under this system of soil management, were easier to handle from the standpoint of pruning and gave a higher percentage of desirable grades of fruit.

Due to the limited land area available at the time this orchard was planted, it was not possible to plant a sufficient number of trees to give the necessary plot replicates. This project will be discontinued until land is available for a more comprehensive experiment.

Fruit Variety Studies—Bunch Grapes: Variety tests are fundamental to a fruit program for two reasons: (1) to determine the adaptability of a variety to environment and use, and (2) as a source of breeding material.

Records have been kept on some seventy varieties and seedlings as follows: Vigor of plant, resistance to insects and diseases, bunches per vine, average weight per bunch, and, in the case of seedlings, a description of the plant and fruit.

In connection with the variety studies, differential fertilizer treatments have been started using the variety Niagara. The fertilizer studies have not progressed far enough to give significant results.

LIVESTOCK

Cooperating with the N. C. Agricultural Experiment Station and the Office of Forage Crops, U. S. D. A., EARL H. HOSTETLER, JOHN E. FOSTER and R. E. STITT.

A Study of Pastures and Their Utilization by Sheep: Grazing work has been in progress with sheep on annual pastures of Abruzzi rye and Korean lespedeza, barley and Korean lespedeza in comparison with permanent pastures. September seedings produced the only fall grazing, and yields of barley and rye were similar. Lespedeza yields were better following barley than rye. The highest yield for the season was produced by the November seeding of rye with lespedeza. The November seeding of barley with lespedeza ranked second in total seasonal yield. The permanent pasture produced less than any of the annuals.

Breeding Stock: The station furnishes ewes and purebred Hampshire rams as breeding stock when available, at reasonable prices.

The Family Sow: This project is to determine the cost of maintaining three purebred sows and one purebred boar and their offspring under general farm conditions. Breeding stock is sold to farmers of the section.

COTTON BREEDING STATION

Cooperating with U. S. Department of Agriculture and N. C. Agricultural Experiment Station, P. H. KIME and R. H. TILLEY.

Under a Public Works allotment of \$56,000 to provide land, buildings, and other facilities for investigational work on cotton, a Federal Station was established in 1936, adjoining the Piedmont Experiment Station at Statesville, N. C. Work at this station is cooperative with the State Department of Agriculture, the N. C. Agricultural Experiment Station, and other State Agricultural agencies, with the object of improving the status of cotton production through (1) developing better cultural practices, (2) producing varieties superior in yield and quality and more resistant to diseases and other factors adversely influencing production, (3) studying the diseases of cotton and deter-

mining methods for their control, (4) determining the underlying principles concerned in the production of quality cotton and its improvement, and (5) developing and applying methods for utilizing and maintaining quality seed stocks, particularly through single-variety communities. These investigations are a part of a national program of improvements in production and quality American cotton.

Fundamental to such a program is a more thorough study of existing varieties from broad cotton belt standpoint. It is necessary to make a more complete inventory of the present cottons before the most intelligent sort of production is set up for further improvement. Varieties are now being studied with the view of determining the influence of soil, region, season, and variety on yields, useful factors and quality of fiber as measured by field performance, ease of picking, ginning tests, technical measurements of fiber properties, spinning tests, etc.

Cotton Breeding: Improvement in the quality of the fiber along with high productivity and disease resistance are the principal objectives of the program. The length, uniformity, fineness, structure and strength of the fiber determines the strength and quality of the manufactured product. Large numbers of pure lines have been isolated from commercial varieties by self pollination and line selection. Many selections have also been made from single and double cross hybrids. These pure lines and hybrid selections are tested in the field in comparison with commercial varieties and breeding stocks from other stations. Data is obtained on yield, earliness, staple length, lint percentage, and boll size. Fiber strength, uniformity and fineness are also determined. The Coker 100 strains, Deltapine No. 14, and certain inbred lines and selections from hybrids have been consistently high producers. The best fiber properties were found in inbred lines selected from the Stoneville 4B and Stoneville 2B varieties. Some of the selections from hybrids also had very strong fiber. One selection had very fine fiber but only average strength. Seasonal conditions cause fiber quality to vary from year to year, between locations and between pickings. The fiber of 22 seed stocks was consistently finer and stronger in 1943 than in 1942. X-ray photographs of the fiber of these same seed stocks also indicated better quality in 1943. The second picking of 10 varieties grown in 1942 averaged 3/32 inch longer than the first picking. Some evidence of hybrid vigor in the first generation was found when the first and second generations

were compared with their parents. Some of the latest strains of commercial varieties and the most promising breeding stocks are grown each year to supply material for spinning tests.

TOBACCO STATION—OXFORD, N. C.

E. G. MOSS, *Assistant Director in Charge and Senior Agronomist, U.S.D.A.*

Station Established in 1912.

Area of Station, 329 Acres.

Soil Types: Durham and Sandy Loam.

Elevation, 500 feet above sea level.

Climatological Data for 1943:

Mean Annual Temperature, 58.8 degrees Fahrenheit.

Annual Rainfall, 32.83 inches. Total Snowfall, 3.2 inches.

GENERAL

The primary object of the work at the Tobacco Station is to improve the tobacco crop by better cultural methods, better methods of applying fertilizers, crop rotations, varieties, distance of planting, disease control and better curing methods, and studies in the production and handling of aromatic tobaccos.

In addition to the work which is being carried on at the Tobacco Station, intensive studies of tobacco diseases are made with particular reference to Granville wilt, root-knot, black shank, and black root rot. In order to carry on these four projects, there has been leased a plot of land consisting of 2 acres in Forsyth County for the study of black shank, a small plot in Rockingham County for the study of black root rot, a plot of land in the southern part of Granville County near Creedmoor consisting of 8 acres for the study of Granville wilt, and 20 acres in Wake County, which is a part of the McCullers Branch Station.

RESEARCH

All the research with tobacco is handled in cooperation with the U. S. Department of Agriculture and the N. C. Agricultural Station. The general leaders in all tobacco experimental work in the State are W. W. Garner, E. G. Moss, T. E. Smith, N. W. Weldon, J. F. Lutz and C. F. Stahl.

Results Secured from Fertilizer Studies: During previous years the results secured from fertilizer studies have emphasized the importance of stepping up the rate of potash applications in mixed fertilizers at the same time, however, indicating where high rates of soluble salts were used directly under the

tobacco plants poor stands were secured, resulting in reduced quality and yield. To avoid such trouble fertilizers should be applied three to four inches on each side of the plants, or if placed directly under the plants, should be thoroughly mixed with the soil before transplanting is done. Large quantities of nitrogen injure the quality of flue-cured tobacco more than excesses of any other element. For this reason the amount of nitrogen used should be kept at the minimum required to produce a satisfactory yield. In order to do this a careful study should always be made of the previous cropping system used. It is definitely determined that on light sandy soils a part of the fertilizer should be applied as a second or side application.

Cropping Systems: Rotation of crops, or cropping systems, play an important part in the control of root diseases of tobacco as well as in keeping the land in the proper tilth. This is especially true of such diseases as Granville wilt, root-knot and black shank. Red top or Herds grass, appears to be the only grass that is highly resistant or immune to Granville wilt and root-knot. Common weeds may be used to precede tobacco on root-knot infested land with good results. On the other hand, land infested with Granville wilt should never be allowed to grow a crop of weeds.

Winter cover crops, such as rye, wheat, oats or rye grass, are very helpful in the control of erosion as well as to add organic material to the soil. In addition they have been found in some instances to be helpful in the control of root-knot diseases.

Varieties: The criticism of the 401 variety is that it grows too high with the leaves too far apart on the stalk. Notwithstanding this objection it continues to produce from 100 to 200 pounds more of high quality tobacco than the old standard varieties. In order to overcome this objection another variety 402 has been developed by crossing Jamaica on 400, which grows not so high with leaves somewhat closer spaced on the stalk. This variety has been tested on different soil types, and the yield and quality are good. The farmers who have helped make the preliminary tests are well pleased. This will be released for planting in 1945. This like all of the 400 series has some resistance to both root and leaf spot diseases and responds well to higher levels of soil fertility.

The black shank resistant strains, Oxford 1, 2, 3 and 4, which were released for planting, have made an excellent contribution to the tobacco production in certain counties in the State. It was



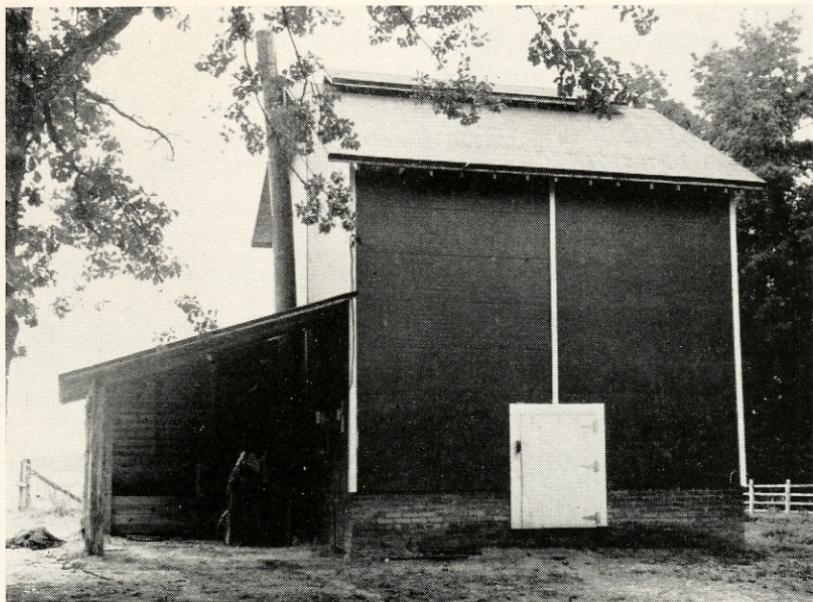
Variety 402 on right and Virginia Bright Leaf on left.

estimated in one county alone that the increased value of the crop for 1943 was as much as \$250,000. Further improvement in these strains is being made, which should make better contributions as time goes on.

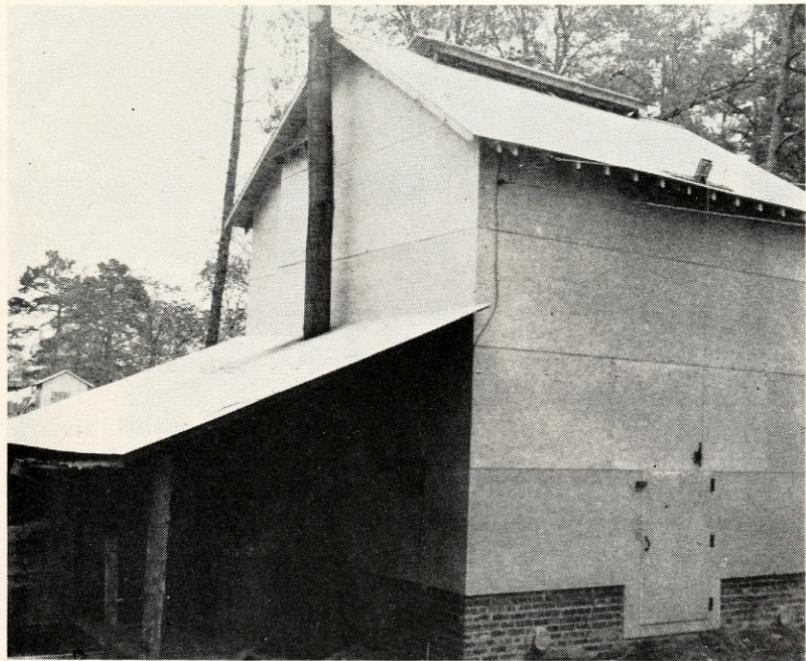
Studies of the Curing Processes: The use of improved methods in curing has proved to be worthwhile. Five types of barn construction have been used, one the cinder block, one the



Cinder block barn with top of tile barn in the rear.



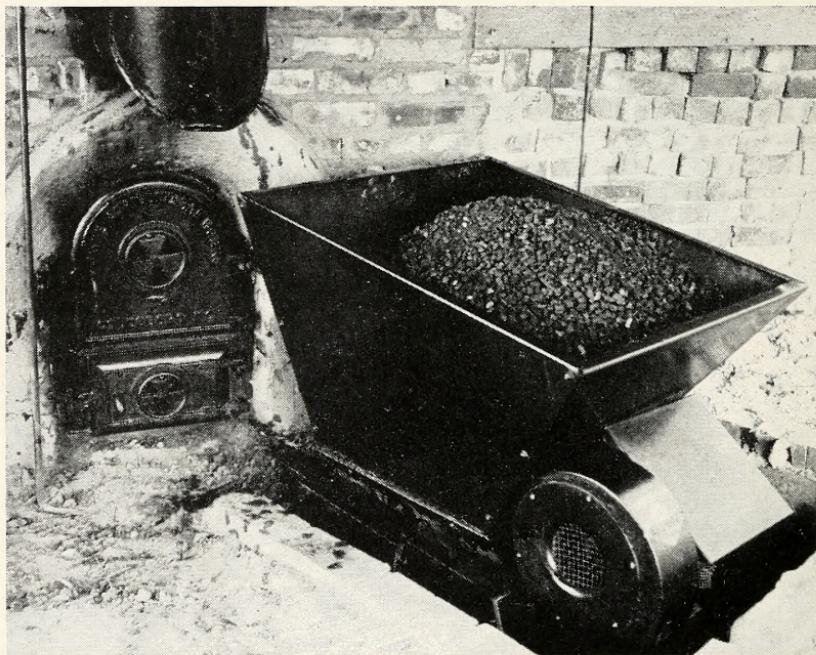
Barn built of gyplap, not insulated.



Barn built of flexboard and insulated with rock wool.

hollow tile, one with flexboard, one with gyplap as compared with the frame barn. Either of these materials may be considered satisfactory for the construction of the curing barn. If the hollow tile or cinder block barns appear to be too porous for adequate control of the temperature, this can be remedied by a good coat of whitewash or paint on the inside.

Coal stokers have been used in comparison with other fuels with very satisfactory results. In 1943 a barn using a coal stoker combined with a hot air jacket to preheat the outside air



Barn showing 40-pound stoker for using coal.

as it was brought into the barn, cures were made with an average fuel consumption of 886 pounds per cure at a cost of \$3.76. So far in 1944 the average has been made on this barn and less coal has been consumed per cure than during 1943. \$3.76 per cure is so far as known the cheapest curing that has been done. This compares with 1½ cords of wood at a cost of \$7.50 per barn. The tobacco cured with coal in every respect appears to be as good as that cured with other fuels.

Tobacco Seed Bed Management: Uramon may be used at the rate of one pound per square yard applied on sandy loam

soils 90 days before sowing the seed for the establishment of permanent seed beds. Cyanamid may also be used with or without choloropicrin to control grass and weed seed. Although neither of these materials will control grass and seed 100 per cent, they are helpful and could be used advantageously. One to 1½ pounds of 4-9-3 tobacco bed fertilizer applied at the time of seeding will give better results than heavier rates.

Studies on Tobacco Insects: The Bureau of Entomology and Plant Quarantine has continued its studies on the control of tobacco insects in cooperation with the Tobacco Branch Station at Oxford, N. C. Special emphasis has been placed on the economical disposal of tobacco plant beds to avoid the building up of heavy flea beetle populations, the protection of newly set tobacco plants from flea beetle injury and the development of new insecticides for the control of hornworms and flea beetles. Results so far have shown that the plowing and harrowing of plant beds or the cutting of the plants just below the surface of the ground with a hoe will eliminate plant beds as an important source of flea beetles in the spring. Several insecticides have shown promise as a protection to newly set tobacco plants from flea beetle damage when these materials are applied to the plants just before transplanting or in combination with blue mold sprays. Progress is being made in the study of new materials for use in the control of hornworms and flea beetles. Materials, such as cryolite, which are effective over a relatively long period of time offer the best possibilities for flea beetle control at the present time. The possible value of the new material DDT in the control of tobacco insects is being given consideration.

Topping of Tobacco: In tobacco topped 16 leaves high compared with tobacco not topped, the yield in 1942 was around 250 pounds and \$135.00 per acre more than that not topped. Even tobacco topped 8 leaves high gave better results than tobacco not topped.

The better spacing distance appears to be 21 to 22 inches in 4-foot rows.

Root-knot: The work on root-knot disease of tobacco conducted at McCullers Branch Station was curtailed for the year 1944 because K. J. Shaw who was doing this work left the Department to go into the Army and was later transferred to commercial work. The work which has been done results in

building up a supply of seed stocks, several of which showed resistance to root-knot and some to mosaic. This work will be resumed during the season of 1945 and expanded as soon as conditions permit.

Progress in Development of Varieties Resistant to Granville Wilt: A high degree of resistance was obtained from T. I. 448 A and selections from this strain crossed on 400 gave lines with



Field showing wilt resistant tobacco No. 6.
This field is badly infested with Granville wilt.

adequate wilt resistance and satisfactory quality. Seed for approximately 50,000 acres of resistant tobacco will be distributed for the 1945 crop. Further improvements in quality are anticipated within the next two years by selection within lines developed by a back-cross to 401.

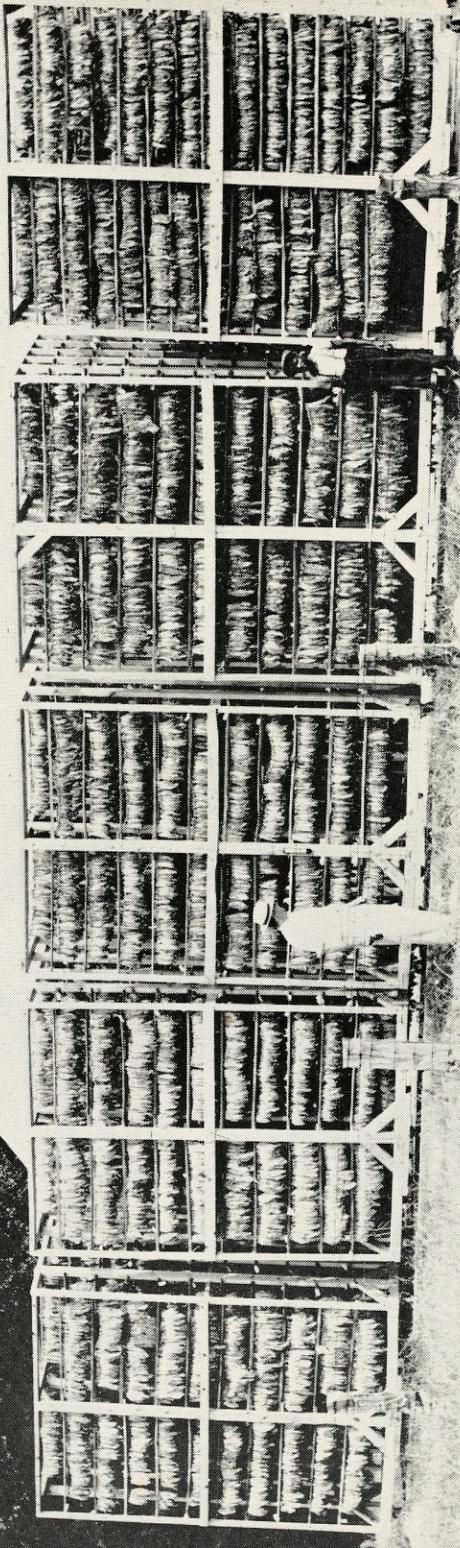
From an economic viewpoint it has been estimated that this resistant variety of tobacco will be worth as much as one-half million dollars in 1944 to Granville County alone. A number of other counties in the State have smaller area just as badly infested with Granville wilt.

Aromatic Tobaccos: Work on aromatic tobacco has progressed rapidly during the past two years. A great deal of fundamental work has been done. Selection and standardization of the better varieties has been made and some breeding work is in progress. Various soil types have been studied in relation to



Field of Aromatic Tobacco. Parties bagging some individual seed heads.

Aromatic Tobacco on racks in the sun.





Aromatic Tobacco in the Hale. Fermentation has already begun.

quality and yield of a tobacco acceptable to the trade. All preliminary reports have so far been favorable and it is possible that a new industry may be developed in areas of the State where large families exist with few money crops. Imports of this type of tobacco vary from forty to sixty million pounds annually, and the indication at present is that we can produce a tobacco which is almost if not quite as good as that grown in other countries. It is not believed at present that this tobacco will be grown in the flue-cured area, but most probably may be grown on the heavier soil types, perhaps in the more hilly or mountainous regions.

UPPER COASTAL PLAIN STATION—ROCKY MOUNT, N. C.

R. E. CURRIN, JR., *Assistant Director in Charge.*

Station Established 1902.

Area of Station, 449 Acres. Soil Types: Marlboro, Rustin, Dunbar, Coxville with Norfolk Series Predominating.

Elevation, 100 feet above sea level.

Climatological Data for 1943:

Mean Annual Temperature, 61.3 degrees Fahrenheit.

Annual Rainfall, 36.03 inches. Total Snowfall, 2.0 inches.

GENERAL

Due to the war we have had to cut down very much on improvements. Our efforts have been directed largely toward tak-



Office building and pecan grove at right.

ing care of our research work and repairing buildings, keeping tools and work stock in fair condition. Due to the retirement of Mr. J. P. Young, Tobacco Specialist, we have discontinued tobacco experiments until after the war.

AGRONOMY

- Cooperating with the N. C. Agricultural Experiment Station.

Cotton Breeding and Improvements (P. H. Kime) :

Objectives: To develop better types of cotton which will meet the requirements of the mills of the State and increase income to growers. Improvement in fineness, strength and uniformity of the fiber combined with productiveness, earliness and other desirable qualities are of prime importance.

Breeding Methods: (1) Development of pure lines by inbreeding and line selection. (2) Hybridization in which single, double and back-cross methods are utilized. Large numbers of inbred lines, and selections from hybrids are in yield test each year. These are compared with the best commercial varieties and also with breeding stocks from other stations. Data is obtained on yield, earliness, per cent of lint, length, uniformity, fineness and strength of fiber.

Results: The Coker 100 strains, Deltapine 14 and inbred isolated from these varieties have been consistently high producers. The best fiber properties were found in pure lines isolated from the Stoneville 4B, Mexican, and Stoneville 2B varieties. Certain selections from hybrids also have good yield and fiber records.

Fiber data obtained on the crops of 1942 and 1943 show that the strength and other fiber properties of different varieties varies greatly even when grown under the same conditions. The fiber of certain strains was found to be 15 per cent stronger than others. Considerable differences were also found in fineness and uniformity of the fiber and in the oil content of the seed.

The data also show that the fiber quality varies from year to year at the same location, between pickings in the same field, and between locations the same year. The fiber was stronger and finer in 1943 than in 1942 at this station. The fiber from the first picking was stronger than from the second picking in 1942. The uniformity of the fiber length varies somewhat between pickings, from year to year, and also between varieties.

Weather conditions, particularly rainfall during the development of the fiber, effect the length, fineness and strength of the fiber. For this reason the staple length may be longer, or the fiber stronger, during some seasons or in different areas.

Corn Breeding (Paul H. Harvey) : In 1942 the corn project used a total of 10 acres which was divided into 1,962 plots. In these plots 148 top crosses, 102 single crosses and 289 double crosses were tested in the area described. In 1943 a total of 14 acres was utilized by the corn project. A total of 2,520 plots were grown. These consisted of 230 top crosses, 159 single crosses and 210 double crosses replicated 1 to 6 times. A very large part of the testing work has been devoted to the development of improved strains for every section of the State. Roughly, one-third of the work has been devoted to research problems and one-third to testing hybrids which might have practical application in the Upper Coastal Plain. This has been considered the main testing station for the corn project, with most of the work on the other branch stations being devoted to testing only commercial hybrids. N. C. Hyb. 1111 (white hybrid) has averaged 45 per cent more corn during the last three years at this station than has Biggs' two-ear. The yield respectively has been 54.7 and 37.7 bushels per acre. N. C. Hyb. 1032 (yellow) has averaged 18 per cent more grain than Biggs' during the past two seasons, with an average of 44.6 bushels. In 1943 one acre was devoted to seed production of commercial double crosses.

Peanut Breeding and Cultural Investigations (Dr. G. K. Middleton, P. H. Harvey and E. F. Schultz) : Peanut breeding work, variety and strain tests and certain cultural tests designed to determine the relative response of different types of peanuts occupied about ten acres of land on this station during the 1942 and 1943 crop year.

Breeding: Work in breeding techniques consisted: (1) the evaluation of the inherent yielding ability of peanut strains as measured by their performance in the (F_1) first generation, and (2) the multiplication of plants by cuttings to simplify the production of sufficient F_1 material for testing.

A number of crosses were made, most of which were between high oil content strains and locally adapted, high yielding strains with the objective of producing a high oil strain of the large seeded type.

Selections from the local breeding program were in yield tests for the first time in 1943.

Variety and Strain Tests: Advanced yield trials were conducted with 25 strains in 1942 and with 49 strains in 1943. In addition, in 1942, preliminary trials were conducted on 86 strains. This latter included a group of selections from farmers' seed stocks and materials received from the Georgia and Florida Stations, and from the Division of Horticulture Crops and Diseases, Bureau of Plant Industry, United States Department of Agriculture.

Average yield trials conducted during the five-year period 1939-1943 show the Martin County Runner, a medium sized peanut, to have the highest record at this station (Table I). The same kind of results have been obtained in other tests conducted in Edgecombe, Halifax, Bertie and Northampton Counties.

TABLE I

Five-year average yields of leading strains of Virginia Bunch, jumbo, runner and medium runner peanuts at this station, 1939-1943.

Variety	Type	Average yield of unshelled peanuts in pounds per acre
N. C. 4	Virginia Bunch	1,593
N. C. 7	Virginia Bunch	1,603
N. C. 8	Virginia Bunch	1,522
N. C. 31	Virginia Bunch	1,563
N. C. 32	Virginia Bunch	1,595
White's Runner	Jumbo Runner	1,494
Va. 5-24-3	Jumbo Runner	1,405
Martin Co. Runner	Medium Runner	1,637

The medium runner peanuts have a higher shelling per cent than Virginia Bunch and jumbo runner strains. The farmer who plans to sell oil stock would do well to keep in mind the factors of larger total yield and higher shelling per cent.

Spanish peanuts, now much in demand because of their high oil content, have produced lower yields of nuts and lower yields of oil per acre than have strains of Virginia peanuts at this station. On the lighter soils in the southern part of the State, Spanish types have done relatively better.

During 1942 and 1943 two new strains showed up exceptionally well. These were Georgia Sel. 207-2 and North Carolina 1296. In a series of five tests these have each exceeded the Martin County Runner in yield and have a higher oil content. They are both being multiplied for possible distribution as soon as they are tested more thoroughly and as soon as seed stock can be made available.

Time of Planting: Four-year tests show peanuts planted in April to outyield those planted in May or June. Those planted in early June have produced on the average only 65 per cent as much as those planted in April. The reduction in yield for May plantings over April was not severe, the average being 64 pounds per acre.

Spacing Experiment: Spacing experiments conducted over a four-year period show both Virginia bunch and runner types to produce their heaviest average yields in 30 to 36-inch rows, though in 1943 due to the extremely dry period in August, with only a crown crop of nuts set, highest yields were obtained in 24-inch rows. Small white Spanish, in the test for the first time in 1943, produced its highest yields in 18-inch rows.

Potash Fertilization of Cotton Grown in Rotation with Peanuts (W. L. Nelson and J. J. Skinner) : Cotton has been grown in rotation with peanuts for the past several years to determine the amount of potash needed. An average of four years' results show that cotton fertilized with 600 pounds of a 6-8-12 fertilizer gave 1,628 pounds of seed cotton, while 600 pounds of a 6-8-6 fertilizer gave only 1,286 pounds.

Effect of Cover Crops on Yield of Cotton (W. L. Nelson and J. J. Skinner) : The effects of four cover crops, hairy vetch, crimson clover, Austrian peas, and Italian ryegrass, are being determined in two rotations, cotton-peanuts and cotton-corn. While only two results are available, the results obtained thus far indicate that the leguminous cover crops are more effective in increasing the yields of cotton in the cotton-corn rotation than in the cotton-peanut rotation.

Placement and Soluble Salt Content of Fertilizers for Cotton (W. L. Nelson and J. J. Skinner) : Past work has indicated that placing the fertilizer in two bands approximately $2\frac{1}{2}$ inches to each side and slightly below the level of the seed gives the highest cotton yields. In 1943 fertilizers containing high and low amounts of soluble salts were tested at two placements, under the seed and in bands to the side. The results show that side placement of both the low and the high salt fertilizers is necessary for highest yields of cotton.

Corn Fertilizer Test (W. H. Rankin) : This experiment deals mostly with the amounts and time of applying nitrogen to plants. No results have been published on this test as yet.

Soybean Variety and Breeding Work (J. A. Rigney) : Planting tests were begun in the spring of 1942. Variety tests and selections have been continued and studies were made on yields, oil content and shatter-proof of the different varieties. Some of the best strains are being increased for distribution.

PATHOLOGY

Cooperating with the N. C. Agricultural Experiment Station.

Cotton Seed Treatment (S. G. Lehman) : Cotton seed as ordinarily planted carries a considerable amount of short lint (linters). Since the linters are valuable commercially, especially in wartime for manufacture of explosives, growers have been advised to save the linters by reginning their cotton seed before planting. Tests were made in 1942 and 1943 at this station to determine the performance of reginned cotton seed compared with normal fuzzy seed when used for planting purposes. In 1942, the reginned seed gave more rapid germination and a higher percentage of plants alive at thinning time than did the normal fuzzy seed. In 1943, reginned seed gave stands equal to but not significantly better than seed not reginned. A significant difference in speed of seedling emergence was not found between reginned and un-reginned seed in 1943. The difference between the results of 1942 and 1943 are believed to have resulted from difference in soil temperature and moisture at planting time in the two years. Reginned seed do not always give germination superior to natural fuzzy seed. When seed are reginned for planting the reginning should be carefully done removing 125 to 150 pounds of linters per ton of seed. Avoid scalping the seeds. Reginned seed as well as seed having a normal amount of fuzz should be treated with some seed protectant before planting.

New Chemical Seed Protectants Tested (S. G. Lehman) : Treating cotton seed to destroy spores of disease producing organisms before planting has become a general practice. Ceresan, in either 2 or 5 per cent concentration, is the most commonly used for this purpose. Many new chemical compounds having fungicidal properties have been developed recently by the chemical industry. A number of the more promising of these were tested as protectants for cotton seed. Table I gives the percentage of seed which germinated and the yield of seed cotton from the most promising of these seed treatment preparations in 1943 at this station:

TABLE I

Germination and yield from cotton seed treated with seed protectant chemicals before planting in 1943.

Test No.	Seed Dusted with	Germination (Percent)	Yield of Seed Cotton (Pounds)
1	Control, not dusted	7	600
	Arasan	49	1,308
	DuBay 1452-C	54	1,263
	New Improved Ceresan	48	1,350
	Dow No. 5	48	1,233
	Dow No. 6	54	1,335
	G. C. C. No. 1	44	1,305
2	Control, no treatment	18	1,110
	New Improved Ceresan	62	1,225
	Dow No. 5	48	1,235
	Spergon	47	1,250
	Spergonex	50	1,155

All chemicals increased the germination as determined by count of plants alive at thinning time and all but one (Spergonex) increased the yield of seed cotton significantly. New improved Ceresan was found to be more effective than the other preparations in reducing root diseases of young cotton plants.

The usual recommended dosage for cotton seed treatment is 1½ ounces of New Improved Ceresan on 1 bushel of seed. Experiments in which different quantities of this dust were used showed that the dose or rate of application can be reduced to ¾ ounce per bushel with the fair probability of as large increase in germination as if the usual 1½ ounce dosage had been used. A considerable saving can thus be effected in case of shortage of seed treatment dust.

Rates of Seeding Can be Reduced When Treated Seed Are Planted (S. G. Lehman): Tests made in 1943 at this station indicate that the amount of seed needed to give a satisfactory stand of cotton is much less for treated than for untreated seed.

Two varieties, C and D, of about 85 per cent germination were used, C being heavily infested and D only moderately infested with disease-producing fungi. Half of each variety was left untreated and half was treated with Ceresan. These treated and untreated seed were planted at 3 seeding rates; namely, 4, 7, and 10 seeds per hill (equivalent to 13, 22, and 32 pounds per acre). Untreated seed of neither variety gave a satisfactory stand even where 10 seeds were planted per hill. Where treated

seeds were used, 4 seeds per hill of variety D gave satisfactory percentage (96%) of surviving hills, the hills having an average of 3.3 plants per hill. Four treated seeds of variety C gave slightly less than a satisfactory percentage (94.2%) of surviving hills, and an average of 2.9 plants per hill. Planting 5 treated seeds of variety C per hill would have given a satisfactory percentage of surviving hills with more than the needed number of plants per hill. Where 7 and 10 seeds were planted each variety gave satisfactory number of hills, the hills having more than twice as many plants as needed. Thinning was desirable where 7 and 10 seeds were planted per hill but was not necessary where 4 seeds were planted. The usual recommended seeding rate for cotton is one and one-half bushels (48 pounds) per acre of seed germinating 8% or more. Less than one-third this amount of treated seed gave satisfactory stands in these tests and the labor incident to thinning was largely eliminated by planting in hills. At the highest seeding rate (32 pounds per acre) untreated seed failed to give satisfactory stands. Both seed and labor may be saved by planting treated cotton in hills.

Hormones on Cotton (S. G. Lehman) : Hormones were used on cotton in a number of tests at this station in 1942 and 1943. In certain of these tests, the hormones were added as dusts to the seed before planting. In other tests the hormones were dusted on the plants during the blooming period. The results of these tests have been largely negative and do not justify a recommendation for the use of hormone dust treatments on cotton seed or on growing cotton plants.

Corn Seed Treatment Test in 1943 (S. G. Lehman) : Seven lots of corn seed, each collected from a different state, were planted in a corn seed treatment test. A part of each seed lot was treated with Semesan, Jr. before planting and part was planted without treatment. Stand counts were made to determine if the treated seed gave a higher stand of plants than the untreated seed. The stand from the treated seed of each of the 7 lots was somewhat greater than the stand from the corresponding untreated seed. The increases ranged from 1 to 11 per cent. The average increase was statistically significant. Because of the small stand difference and because of thinning reduced this difference to a still smaller figure, it appeared that no significant yield difference could be expected, therefore, yield records were not taken.

Peanut Disease Control Experiments (Dr. Luther Shaw): Approximately 25 chemical dusts were tested as protectants against peanut seed decay. Both hand-shelled and machine-shelled seed of the Virginia Bunch and Spanish varieties were used. Outstanding increases in seedling emergence were obtained from certain of the materials used. The four most promising materials together with the amount applied to 100 pounds of seed to get best results and the cost of material were as follows:

Arasan, 2 to 3 ounces, 16 to 24 cents
2% Ceresan, 3 to 4 ounces, 12 to 16 cents
Yellow cuprocide, 4 ounces, 12 cents
Sperton, 4 ounces, 50 cents

It was found that germination of machine-shelled seed was considerably below that of hand-shelled seed. This disadvantage of the machine-shelled seed was largely, although not entirely, overcome by seed treatment. The tests in 1942 indicate that machine shelling combined with seed treatment offers a good alternative to the more laborious hand-shelling method of preparing peanut seed.

Unshelled seeds of the Spanish variety gave much poorer stands than hand or machine-shelled seed.

Results in 1943: A number of seed treatment materials were tested on peanut seed again in 1943. The four commercial preparations, Arasan, 2% Ceresan, Yellow Cuprocide and Sperton, which gave outstanding results in 1942, gave large increases when used in 1943. The average percentage increases from seed treatment in four experiments involving these materials were as follows: Arasan, 35%; Ceresan (2%), 44%; Yellow Cuprocide, 39%; and Sperton, 26%. Two new preparations, Spergonex and DuBay 1452-C, tried in 1943, increased emergence approximately 30 per cent.

Experiments were made to determine if the date of planting had any effect on the efficiency of the materials used for peanut seed treatment. Treated and untreated seed were planted on 3 dates, April 16, May 5, and June 3. Findings were as follows: (1) Germination of the seed decreased as the date of planting was delayed; (2) this drop in germination is partially, but not entirely, prevented by seed treatment; (3) yields decreased as the date of planting was delayed; and (4) decreased stands were not wholly responsible for the decreased yields at the later planting dates.

Peanut seed of the Virginia Bunch variety treated 81, 60, 30 and 3 days before planting and stored in an unheated room, gave emergence counts of 94, 93, 92 and 97 per cent. These results indicate that peanut seed of this variety may safely be treated a considerable period of time before planting without harm to the seed or decrease in effectiveness of the treatment.

Owing to the difficulty experienced in preparing small-podded varieties of peanuts for planting, several experiments were performed in which various seed treatments were administered to unshelled, hand-shelled and machine-shelled seed of the Spanish variety. The results of these experiments point to the following conclusions: (1) unshelled and untreated seed of the Spanish variety can be expected to germinate, on the average, around 35 to 40 per cent; (2) dusting the unshelled seed gave only small increases in germination; and (3) hand-shelled and machine-shelled seed treated with Arasan may be expected to give approximately twice as good germination as treated, unshelled seed. Tests were made to determine if treatment of peanut seed with seed protecting chemicals was compatible with bacterial nodulation of the plants. Commercial inoculum was applied only to the seed planted on certain plots and only to the soil of other plots. Inoculation did not significantly increase yields at a location where peanuts had grown before. At a location where peanuts had not previously been grown, significant increases in nodulation and yields did not occur when the inoculum had been applied to the seed treated with seed-protecting chemicals. However, where the legume inoculum had been applied to the soil, definite increases in nodulation and yields did occur. Seed treatment did not appear to interfere with nodulation originating from bacteria in the soil.

Tests were made again in 1943 comparing hand and machine-shelled seed of the Virginia Bunch variety. Emergence of untreated hand-shelled seed was usually considerably better than untreated machine-shelled seed. Only small differences in germination were obtained when the two types of seed were treated before planting. From these results it appears that peanut growers can machine-shell and treat their peanut seed and expect satisfactory stands. Machine shelling can be done at considerably less cost than hand shelling.

Leaf Spot Control of Peanuts (Dr. Luther Shaw): Extensive tests have been made to determine the value of Leaf Spot

control. Several different materials have been used. Sulphur dust alone has given increased yield, both in nuts and hay. Sulphur dust plus 4 to 6 per cent copper has given somewhat better results. Three to four applications, beginning about July 15th, using about 15 pounds each application will usually give sufficient control. If heavy rain falls within twenty-four hours the treatment should be repeated.

BLACKLAND TEST FARM—WENONA, N. C.

J. L. REA, JR., *Assistant Director in Charge*

Station Established in 1912.

Area of Station, 362 Acres (State). Soil Types: Peat and Muck.
1,158 Acres (Leased).

TIDEWATER EXPERIMENT STATION—PLYMOUTH, N. C.

Station Established in 1943.

Area of Station, 1,993 Acres. Soil Types: Peat, Bladen, Portsmouth,
Hyde and Coxville Groups.

GENERAL

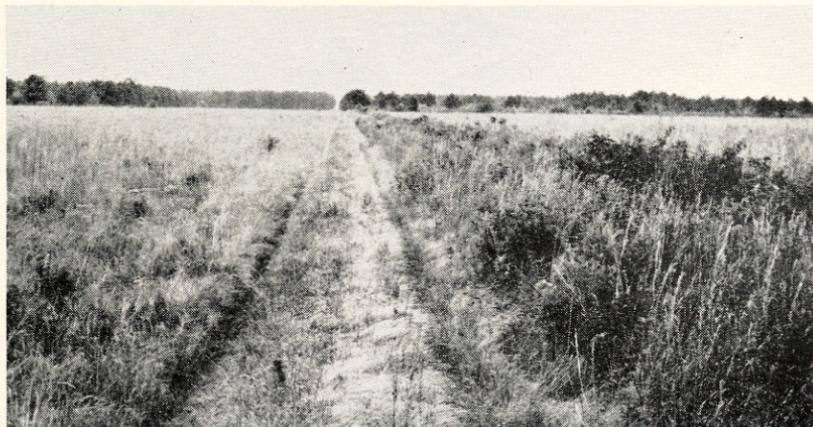
The old Blackland Station at Wenona is to be sold. The farm has 362 acres of peat and muck soil, 160 acres in cultivation and the remainder in native reed grazing areas. All fields are under fence. The water system is from a 300-foot well with pump and elevated tank. The buildings consist of a two-story four-room office building; five one-story dwellings, two of six rooms, two of five rooms, and one of four rooms with small chicken house for each dwelling. One two-story horse barn, 34'x60'; one two-story cow barn, 46'x60'; one two-story beef cattle barn, 24'x60'; one hog barn, 24'x60'; one two-story implement shed, 34'x60', with 18' shed on each side; one two-story grain storage building, 30'x40'. Four-car garage; meat storage building, 14'x14'; and wooden silo on ground, 10'x54'.

The work with hybrid corn and soybeans is being carried on at the new station, and other work will be transferred as fast as labor is available to take care of the work. The experimental work with beef cattle, hogs and sheep is being carried on at the Blackland Station until buildings, fences and pastures can be provided to take care of the livestock program at the Tidewater Station.

The new Tidewater Station was purchased in the fall of



New Tidewater Experiment Station, 1993½ acres. Located on U. S. Highway No. 64, five miles east of Plymouth, N. C.



1943. This farm consists of 493 acres in the main farm with 1,500 acres of rough undrained pasture land. About 260 acres of the main farm is now in cultivation and about fifty more acres can be put into cultivation at a very small cost.

Due to restricted travel during the past biennium the field days have not been held as in the past. The station has, however, tried to assist the farmers as best it could with their problems. All possible assistance has been given the war effort.

ANIMAL HUSBANDRY RESEARCH

In Cooperation with the N. C. Experiment Station, EARL H. HOSTETLER and JOHN E. FOSTER, and the U. S. Department of Agriculture, H. H. BISWELL and R. W. COLLINS, U. S. Forest Service.

Projects at Blackland Station: The subprojects outlined in the working plan for the Forest Grazing Project were continued through 1943. The tests conducted at Blackland Station in 1941 and 1942 were repeated in 1943. Grade Hereford cattle were grazed on native reeds (*Arundinaria tecta*) from May 14 to October 24 when the grazing season was closed on account of forest fires.

Subproject No. 1—Rotation Grazing on Forest Range: Continuous grazing was compared with changing to ungrazed pastures on August 5, and with rotating between two pastures every 28 days. Three groups of ten steers or bred heifers each were used in the trial. The comparisons were set up in duplicate except that heifers were used in one set of pastures. The pastures were grazed at the rate of three acres per yearling for the season. The results of the rotational grazing were similar to those of the previous years except that the gains were slightly greater. The average daily gains were only .88 pound, however, and the differences between the groups were not significant.

The forage in all pastures was made up largely of reeds, and observations showed that the cattle preferred to eat the continuous regrowth of reeds. The reeds in all pastures were utilized moderately and showed no effects due to system of grazing.

A repetition of the trial was started on May 11, 1944.

Subproject No. 2—Creep Feeding of Calves on Forest Range: Four groups of ten cows and ten nursing calves each were used. Groups I and IV received no supplement. Calves in Group II were creep fed (4 parts corn and 1 part C.S.M.) throughout the period, but those in Group III were not creep fed until August 5. Group IV was moved to lespedeza pasture on August 5. The pastures were grazed at the rate of four acres for each cow and calf.

The cows and calves again made very satisfactory gains on reeds. Creep feeding increased the rate of calf gains especially after August 5, as was the case in the 1941 trials. Moving to lespedeza pastures on August 5 increased the comparatively rate of gain to October 24. The cows and calves in this group made the greatest gains for the season of any of the groups. The calves from this group and the creep fed groups were in good

slaughter condition at weaning at close of the test. The average weights of the calves for the different groups at close of the trial ranged from 387 to 437 pounds.

A repetition of this trial was started on May 11, 1944.

There are over nine million acres of forest land in the Coastal Plain region of North Carolina. Forest land grazing in this area makes up 29% of the year long keep of beef cattle and reeds are the most important source of native forage. Determining the most practical method of utilizing reeds would be of infinite value to this and all similar sections. This is especially true now since it offers possibilities for greatly expanding beef production, which is so urgently requested to meet our war demands. In addition utilizing reeds would greatly reduce the serious and destructive forest fires.

Subproject No. 4—Effect of Two Rates of Grazing on Burned and Unburned Areas: The set-up for this experiment was destroyed by fire in the fall of 1941. However, further observations of the effects of fire showed that reeds on burned areas shed their leaves more readily the next fall than those on unburned areas. Last year it was reported that burning delayed the start of the grazing season by at least two weeks, reduced the carrying capacity, and made the reeds more easily killed by heavy grazing. These observations indicate that there is no place for fires in the reed forage type.



Hereford cattle on grazing tests at the Wenona Station.

Subproject No. 6—Wintering Calves on Reed Pastures: Forest fires which burned over the reed area prevented the starting of a second trial in the fall of 1943. The results of the first trial for the wintering period were given in the 1943 report.

The following summer, when all yearlings were grazed together on reeds to study the effect of wintering on pasture gains, the gains were in reverse order to the winter gains, thereby greatly reducing the difference in the average final weights of the four groups. In neither case was the greater final weight of the farm-wintered groups nor the group that received four pounds of supplement during the winter (all three of which were practically equal) sufficient to offset the cheaper wintering of the group that had received only two pounds of supplement during the winter.

The wintering period is the most critical and expensive phase of beef production. It is of utmost importance that better and more economical methods for wintering be developed. Both rye and rye grass show promise for winter pasture in this area. Furthermore if reeds, which are so abundant on idle land in the Coastal Plain, can be efficiently used for wintering beef cattle the production of beef can be greatly increased. (This area brings in a high percentage of the beef consumed). Such a practice would help our war effort not only by increasing the beef supply but by releasing large amounts of feed and land for other livestock.

Subproject No. 7—Relative Grazing Values and Nutritive Properties of Forage: Cattle have been followed systematically at Wenona, Cypress Creek and Deppe to make observations on grazing habits and to collect samples of forage, representing cattle diet, for chemical analysis. The samples, which contained proportionate amounts of the different plants grazed, were analyzed for crude protein, phosphorus, calcium and other constituents.

Crude Protein: The forage at Wenona contained sufficient crude protein for normal nutrition throughout the time the cattle were on native range. The crude protein content was highest in June and gradually decreased as the season progressed, until it reached its lowest period in December and early January.

At Cypress Creek the crude protein content was consistently lower than it was at Wenona, averaging about 5 per cent lower,

but the trend during the season was about the same. That is, the crude protein content was highest in early spring and summer and decreased gradually through the summer.

At Deppe, where the cattle grazed in winter, the forage was definitely deficient in January, February and March. Where forest range is used during these months the forage should be supplemented with feeds high in crude protein so the cattle will maintain weight.

Phosphorus: The forage at Wenona is deficient in phosphorus during December and January. At Cypress Creek it is deficient from June until the end of the grazing season. The phosphorus content is highest in early spring and summer and decreases gradually throughout the summer. At Deppe the forage contains only one-third enough phosphorus in January, February and March for normal nutrition. Generally speaking phosphorus supplements are needed year long on range at Cypress Creek and Deppe, and during December and January at Wenona.

Calcium: The forage contains enough calcium throughout the year at all three places to meet cattle requirements, and calcium supplements are not needed.

SWINE

Comparison of Protein Supplements for Fattening Pigs (Earl H. Hostetler and J. E. Foster) : Eighty pigs were equally divided into four groups of twenty pigs each. In addition to shelled corn the pigs were fed the following protein supplements:

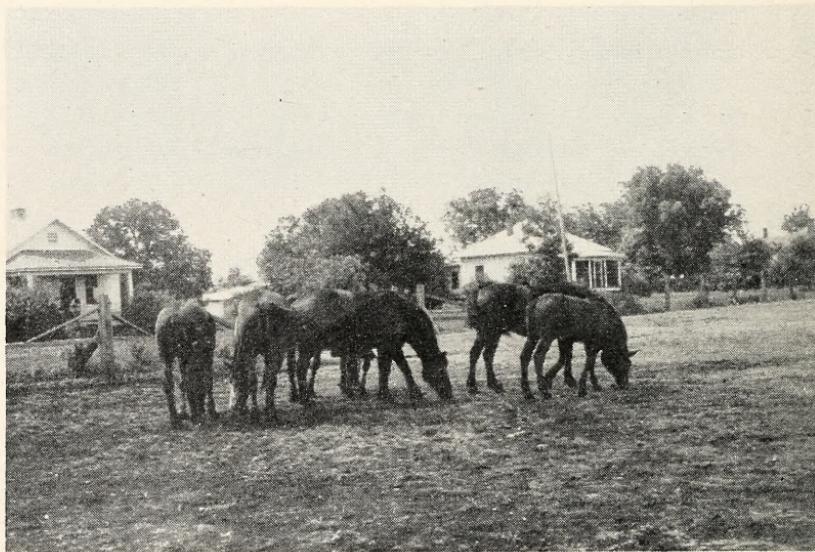
Group 1		Group 2	
Tankage 50%	45 lbs.	Tankage 50%	20 lbs.
Cottonseed meal	45 lbs.	Cottonseed meal	35 lbs.
Limestone	8 lbs.	Soybean Oil meal	35 lbs.
Salt	2 lbs.	Limestone	8 lbs.
	100 lbs.	Salt	2 lbs.
	100 lbs.		
Group 3		Group 4	
Cottonseed meal	30 lbs.	Cottonseed meal	45 lbs.
Soybean Oil meal	30 lbs.	Soybean Oil meal	45 lbs.
Peanut Oil meal	30 lbs.	Limestone	8 lbs.
Limestone	8 lbs.	Salt	2 lbs.
Salt	2 lbs.		
	100 lbs.		
	100 lbs.		

Results are as follows:

	Group 1	Group 2	Group 3	Group 4
Cost of feed per 100 lb. gain	\$10.68	\$9.33	\$9.20	\$9.36
Profit per pig over feed cost	3.96	6.00	6.09	5.65

Mineral Studies with Brood Sows (Earl H. Hostetler and J. E. Foster): Two groups of sows have been fed on different minor elements to improve the breeding and study the effects on the pigs farrowed. The results have not been conclusive enough to make any definite statement as to the benefits derived from either of the mineral mixtures used.

Improvement of the Family Milk Cow: This station has kept for a number of years a purebred Guernsey bull for public service to improve the quality of the milk cows of farmers in the vicinity of the station. A marked improvement has been shown in the breeding and production of the milk cows that have been sired by the station bull.



Percheron horses at Blackland Station.

Workstock: The Blackland Station has a few purebred Percheron mares and also a few grade Percheron mares that are being bred to a purebred Percheron stallion to produce all the workstock used on this station with the surplus going to the other station needing workstock. No experimental work with horses is being done at this time.

AGRONOMY

Cooperating with the N. C. Agricultural Experiment Station and the U. S. Department of Agriculture.

Soybean Variety Studies (J. A. Rigney and W. E. Hartwig): Old established varieties of soybeans as well as many of the new varieties that show promise are being tested for yields and oil content. Below is a table showing the yield, oil content and date of maturity for the most promising varieties that are being tested:

	1942 Yields	1943 Yields	% Oil	1943 lbs.	Mature
				Oil/A	
Ogden	30.1	25.8	21.2	328	9-28
Volstate	25.3	18.5*	20.4	226	10-25
Tokio	28.4	16.3*	18.6	182	10-25
Woods Yellow	28.4	14.6*	17.3	152	11- 1
Arksoy	25.2	23.0	20.5	283	9-28

*Injured by early frost.



Ogden soybeans at Blackland Station.

Inoculation Tests: Inoculation tests using Nitrogen, Nod-o-gen and Urbana culture, but no benefit was observed over no inoculation.

Harmone Dusts: Two harmone dusts (Staleymone and Rootone) were dusted on seed of three varieties at planting, but no effect was observed.

New Varieties of Soybeans: Two new varieties of soybeans, Ogden and Volstate are being grown, certified and distributed to the farmers by this station. This work is being carried on in cooperation with the Experiment Station and the U. S. Department of Agriculture.

Manganese Deficiency on Soybeans (W. L. Nelson) : This work was started in the spring of 1944 and no data are yet available.

Hybrid Corn (P. H. Harvey and Walter Gregory) : During 1942 fifty double cross hybrids and fifty top cross hybrids were tested for yield. In 1943 twenty-five double cross hybrids and 100 top crosses were tested.

The best yellow hybrid tested during these two seasons was N. C. Hybrid 1032 which averaged 44.8 bushels per acre as compared to 37.5 bushels for the strain of Jarvis being grown at the Blackland Station. This is an increase of 19.4 per cent in favor of the yellow hybrid. Neither yellow strain produced as much as the white strains. In experimental double cross test N. C. hybrid 1121 produced 57.0 bushels per acre as a two-year average in comparison with 48.0 bushels for Highland Horse-tooth, an increase of 18.8 per cent.

The hybrid corn work will be increased on the new Tidewater Station. In addition to testing the various hybrids as they are being developed, disease resistance and insect damage will be studied. European corn borer is now known to be present in nine northeastern counties. This insect which might become a real factor in corn production will be watched carefully.

PATHOLOGY

Cooperating with the N. C. Agricultural Experiment Station

Seed Treatment (S. G. Lehman) : Various seed treatments with soybeans and corn have been carried on during the past two years. While some of the materials used are showing up well, the work as a whole, has not been carried on long enough to make any definite conclusions.

IMPROVEMENTS

Since all experimental work is to be discontinued on the Blackland Station as early as practical without disrupting the work, and the Blackland Station is to be sold, little more than bare maintenance has been done. Work on the new Tidewater

Station has consisted largely of putting in tile bridging, cleaning ditches, moving fences and other repair jobs necessary before the land and building can be used to carry on the work of the station. This work is being pushed as fast as labor and funds will permit.

Up until the present time we have not been able to erect any new buildings but plans are now being made to build enough buildings to meet essential needs until the emergency caused by the war is over. The improvement work at the new station will necessarily have to be slow due to the scarcity of materials and labor.

The station has carried on for the past two years with about half the help that was employed during the previous biennium. Labor saving machinery has been purchased when available to replace labor in so far as it could be used. This has enabled the station to produce about as much grain, hay and other crops as was produced in previous years.

COASTAL PLAIN STATION—WILLARD, N. C.

CHARLES T. DEARING, *Assistant Director in Charge
and Agent, U. S. D. A.*

Station Established in 1905

Area of Station, 445 Acres. Soil Type: Norfolk Sandy Loam.

Elevation, 51 feet above sea level.

CLIMATOLOGICAL DATA FOR 1943:

Mean Annual Temperature, 62.4 degrees Fahrenheit.

Annual Rainfall, 43.00 inches. Total Snowfall, 9 inches.

GENERAL

The question may be asked as to whether or not the activities of the station have been worth the cost to the State. Some ten years ago this station introduced the Blakemore strawberry. This berry has gradually replaced the Missionary berry on the Wallace, North Carolina, cash auction market and has from the start sold at prices of \$1.00 or more per crate above Missionary year in and year out. During the past season another variety introduced from the station sold on an average of more than \$2.00 a crate above Missionary. In the average season the Wallace market will sell over 150,000 crates. At least, fifty per cent of these crates throughout the ten-year period have been of the new varieties which this station has introduced to the farmers. Since each of these crates has brought the farmer at

least \$1.00 more than he would have gotten with the varieties which he would otherwise have been growing, it will be seen that this one work of the station has brought profits to the farmers right in this one community (the Wallace, N. C., cash auction market) amounting to at least \$75,000.00 per year. This is around six times the cost of the station to the State. This does not take into account what has been done to improve the farmers' financial position through the other lines of research with strawberries which have resulted in better cultural methods, better treatment for diseases and insects with resulting high yields, and better packing methods which have resulted in higher prices per crate. When just this one project can show such a record of the station's value in just this one community, it will be seen that the State is deriving as a whole a handsome profit on its appropriations for the Test Farms.

PUBLIC RELATIONS

The public is reached by the station through various channels, such as public meetings, research activities, demonstrational activities, correspondence, day by day visitation of North Carolina citizens, and in other indirect manners. The most outstanding contact between the station and the public is through the Annual Field Day and Picnic, but due to war conditions, the necessity of saving tires, gasoline, etc., and the shortage of labor on the station, it was deemed advisable to abandon the Field Day for 1943. In 1942 a very nice day was held with approximately three thousand people present. On this occasion the program of the day featured civilian defense activities, and the day served as a means for the civilian defense organization to reach the public of this community through various phases of their work.

A number of smaller gatherings and field meetings have been held for the benefit of research workers, farmers and others interested in special subjects such as small fruits, pastures, forage crops, poultry, dairying, etc. One of these meetings brought together here research workers from most of the states east of the Mississippi River who are working on small fruit projects. Another brought here county agricultural agents, soil conservation service workers, vocational workers and agricultural teachers, farm security workers and others from this and adjoining states to study and see the results from pasture re-

search projects of the station. Another group studied the results from small grain fields at the proper season. Many other smaller groups have conferred here and visited the test fields, and of course, individual farmers frequently take advantage of the opportunity to look over the station and see the results of the tests underway.

During the winter of 1943-44 and the spring of 1944 the station has furnished a site for some of the Army maneuvers which have been conducted all through Pender and Duplin Counties and elsewhere. As many as five different groups were camped on the station property at different times and for different lengths of time. The station is glad to have had an opportunity to cooperate with the armed forces and to have had the opportunity of serving as host to some of our soldiers in training.

IMPROVEMENTS

Due to wartime conditions, the station has held down on its usual improvement program. Only such improvements have been made which appeared to be absolutely necessary from the standpoint of wartime conduct of the station. The principal improvement item was the purchase and construction of dairy fencing. This was absolutely needed in order that the different pasture plots could be grazed separate from each other. The fencing was needed in order to keep certain lots of cows on their proper pasture grazing area. It was impossible to purchase, under wartime conditions, woven wire fence. We, accordingly, constructed the fence with wartime barbwire. It is recognized that this will not last long, but it will serve to bide over until high grade cattle fence can be procured, and in the meantime it will serve the purpose of separating the different grazing areas from each other and restrain the cattle to their proper areas and prevent them from going to the property of other parties and doing damage. High grade locust fence posts were procured. For the present we are using only homemade temporary gates with the intention of purchasing good woven wire gates after the war. We purchased and installed 1021 line, corner and gate posts, and we used 50 rolls of barbwire on this project.

In electric brooder was purchased and installed, which is a great improvement for the poultry research plant. We also pro-

cured a combine which was needed in order to put into practice a program of grain growing and testing. To facilitate the large amount of hay making and permit the making of this hay with limited labor forces, a side delivery rake and hay loader were procured. With the use of this equipment we were able to get in hay from the fields to the barns very satisfactorily with a three-man crew.

Another improvement program which has been carried out has been that of improving the land of the station by sweetening the soil; that is, increasing its PH reading. This has been done with the use of basic slag, which contains 40 per cent calcium oxide, but also contains 8 per cent phosphoric acid which has served as a fertilizer, and small amounts of manganese oxide, magnesium oxide and iron oxide, oxides of the minor elements deficient in the station's soils. The use of this basic slag has been very beneficial and the results from its use have justified the expense.

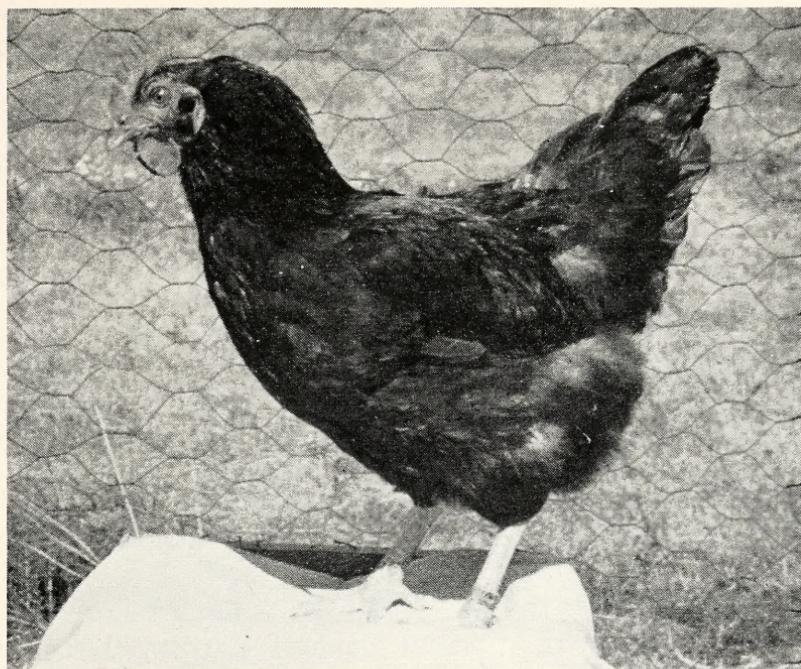
RESEARCH

The Coastal Plain Station has been especially short on labor due to its location in the midst of various war activities which has drained the labor from the territory. Our labor forces have also been depleted by Army recruiting and drafting. Accordingly, it has been impossible to maintain the large program of research which we were conducting, but we have up to the present held on to the major projects and have succeeded in maintaining them through the biennium as active projects. The following are brief statements of progress and results relating to this program of research.

POULTRY WORK

*Cooperating with the N. C. Agricultural Experiment Station,
R. S. DEARSTYNE and C. O. BOLLINGER.*

The poultry plant is maintained primarily for research, but it furnishes a considerable quantity of poultry products which are marketed as station commodities. The products not only bring revenue to the State Treasury by these sales, but also serve to provide the local community with high grade poultry products. During the biennium two principal research projects have been conducted.



Hen No. 494. This hen produced 312 eggs in one year, which is an outstanding record for a Single Comb Rhode Island Red hen.

Development of Superior Families of Rhode Island Reds: This study was a continuation of previous research work. We used 376 hens in the project in the year 1942-43. 846 chicks were hatched and pedigreed, all special records being continued as in the previous work. In 1943-44, 336 pedigree hens were used and 1,034 chicks were hatched from 52 special mated hens. This work required much record keeping. The average egg production has greatly increased in special single mated pens, the average egg production reaching 300 eggs per hen per year in one pen of 13 hens, one of the pullets laying 312 eggs in 365 days. The average Single Comb Rhode Island Red hen lays less than 200 eggs per year. For the 1943-44 hatching season hatchability of chicks was the highest and the death rate during the brooding period the lowest since the test was started in 1940. This work will be carried on into the next biennium with the promise of still better results being obtained, but if no additional increase were secured this project has already proved its worth by increasing the egg laying capacity of the birds approximately fifty per cent.

A Study of the Effects of Various Stimulating Practices on Egg Production: This project was completed in 1944 and the results will be published as soon as tabulated and summary of the methods used to stimulate egg production is made. It appears that the use of artificial lights during the fall and winter months will show decided results over other methods used to stimulate egg production. In lieu of this project during the next biennium a new project will be started to determine the value of late hatched pullets as egg producers as compared with early hatched pullets. This new project is intended to give the answer to a question being asked and discussed by a alrge number of poultry raisers in the State.

HORTICULTURE

Cooperating with the N. C. Agricultural Experiment Station,
M. E. GARDNER, E. B. MORROW and J. G. WEAVER.

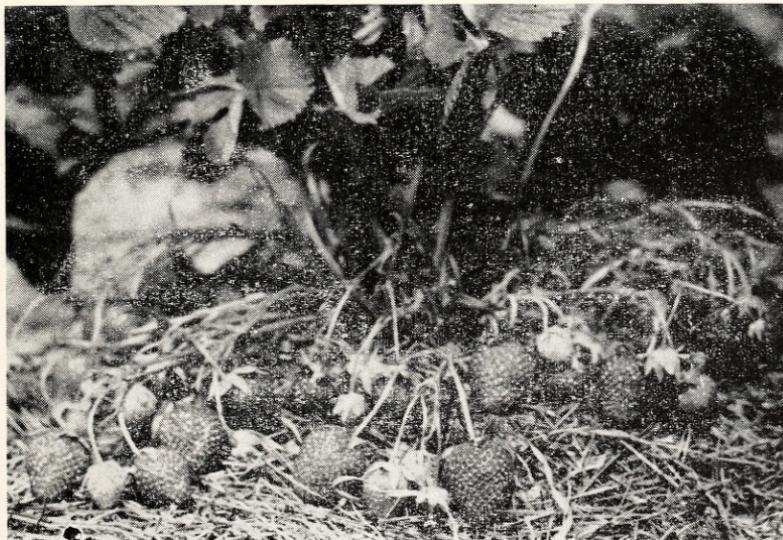
Small Fruits: The breeding work for better varieties and the cultural studies with strawberries, raspberries, blackberries and dewberries has been carried forward during the biennium period. In the 1943 season the variety "Massey," introduced from this station, proved the life-saver for local growers as it is a late variety and produced a crop when the early fruit failed. In the season of 1944 this same variety brought the highest prices on all markets throughout the United States as compared to other varieties sold. The farmers in the Wallace section have evidenced their approval of the Blakemore and Massey varieties introduced from the station and are now growing these varieties almost to the exclusion of all others. The breeding work with both strawberries and raspberries has yielded new selections which are being tested and which offer considerable promise.

Sweet Potatoes: The cultural studies with sweet potatoes have been continued. Seedlings from breeding work have been tested each season and special attention has been given to the matter of endeavoring to produce seed stock of the Porto Rica variety free from wilt. The wilt disease on sweet potatoes is one of the most serious problems we have to face at the present time. Apparently the lack of information and carelessness on the part of the seed producers has resulted in a general infestation. Since this disease works in the soil, it will be hard to eradicate. Accordingly, it is highly important that if possible we develop seed stock which can be certified as being free from



A BLAKEMORE PLANT

These two varieties, originating from breeding work at the Coastal Plain Station, have proven successful and are favored by the growers. In tests during the 1944 season runner plants, rooted in June, 1943, produced fifty percent more berries than runner plants rooted September 1, 1943. The plants shown above are June rooted plants.



A MASSEY PLANT

wilt in order that this stock can be made available to growers for use in lieu of stock already infested with the disease.

Grapes (Charles T. Dearing): From the Muscadine grape work fifteen selections have been introduced and distributed to nurserymen for testing and multiplying and distributing to the general public. Already favorable reports have been received from the nurserymen. The grape crops during the biennium, because of adverse weather and the demand for wine grapes, resulted in prices much higher than those ever paid before. In



Muscadine grape seedlings under test at Coastal Plain Station.

1943, grapes sold at 6 cents per pound and were in the greatest demand at this price. Indications are that the 1944 crop will sell for equally good prices and this crop is also a much better crop. There is already increased demand for Muscadine grapes and the indications are most favorable for grape growing as a promising means of utilizing lands of the Coastal Plain area.

Nursery Work: A new project was started during the biennium. This is a nursery work project and has in mind the testing of all kinds of plants which would be grown in a nursery, especially new introductions, importations, etc., and this project will also serve to permit studies of propagation methods and improved nursery practices.

Beans: The station has also conducted small research projects with beans. A number of new varieties of snap beans have been tested and a number of varieties of the navy bean type were tested because of their relation to war food.

Azaleas: A test was also established of azalea varieties to determine the adaptability of standard varieties under Coastal Plain conditions and to compare these standard varieties with new selections from breeding work at the State Experiment Station.

TRUCK CROP DISEASES

*Cooperating with the N. C. Agricultural Experiment Station,
LUTHER SHAW.*

A study of seed, soil and plant bed treatments relating to the control of diseases of lettuce in plant beds has been carried on during the past biennium. A number of new treatments have been tested. This investigation is of much importance to the commercial lettuce growing industry in the southeastern part of the State.

AGRONOMY

*Cooperating with the N. C. Agricultural Experiment Station,
R. L. LOV VORN.*

Pasture Research: A very comprehensive and important pasture study has been conducted by the forage crop section. This project has studied the fertilizer requirements of carpet grass pastures and various grasses and legumes. The results have emphasized the importance of having fertile conditions in a pasture as well as in cultivated fields. Excessive nitrogen, however, has tended to stimulate the growth of grass to the point of smothering out legumes. On the other hand, some legumes have not persisted unless a reasonable amount of fertility was available. The higher growing strains of Yellow Hop clover and lespedeza seem to be the better types of legumes as companion crops for the carpet grass, but under certain conditions the White Dutch clover is also successful. It has been noted that Dallas grass responds to nitrogen and this can be derived either from fertilizer or legumes.

Soybeans (J. A. Rigney): Extensive soybean studies have been conducted. Not only have many varieties been tested, as in previous years, but extensive cultural studies have been carried out and will be reported later in bulletin form from the Experiment Station.

Hybrid Corn Tests (P. H. Harvey): Another Agronomy project has been the testing of hybrid corn. The Experiment Station is producing hybrid corns through the plant breeding work and this station has served as a location for the testing of these hybrids in the southeastern part of the State. Certain of the hybrids have been outstanding as prolific white corn, as yellow corn and as ensilage corn.

Small Grains: In the last year of the biennium the station undertook grain growing for the first time, and cut down on corn production. It was hoped that this program would not only afford information on grain culture in Southeastern North Carolina, but would enable the station to reduce the complications from bill bug and bud worm on corn by keeping off of corn as much as possible for the next year or two. Fields of from five to ten acres of oats, rye, barley and wheat were grown, and in every case favorable yields were secured under conditions which are considered to be about as adverse as we might normally expect. We had an excessive drought in the fall, an infestation of plant lice, a severe spell of winter weather and drought again in the spring. If a one-inch rain could have been procured about the time the grain started ripening the yields would have been decidedly better, but instead, we had drought with hot burning sun that just dried up the grain without giving it a chance to develop fully, and this cut down the yields. However, in spite of these conditions the yields were most satisfactory and demonstrated the possibilities of grain growing in this section and the importance of farmers using good methods and the best available information. The following table, based upon a report from the Crop Reporting Service on county and State yields during June, 1944, shows the station fields to have produced in each case around twice as much as the county and State averages. This certainly shows that there is an opportunity for great improvement in the culture of grains in this part of the State, if not in the entire State.

	Wheat (bu.)	Oats (bu.)	Rye (bu.)	Barley (bu.)
Pender County	17	33	10	26
State yield	18	32	12	30
Coastal Plain Station yield	34	80	26	36

The Coastal Plain Station is located in Pender County.

Another bit of information which came out in connection with these grain studies was the need of using fertilizer in the

fall. It has been found that in the Piedmont section of this State there is no advantage to fall applications of fertilizer, but here in the east it appears that weather conditions make it advisable to have some nitrogen available in the fall. In a series of tests with each of the different kinds of grains, in every case the plots having fall fertilizer the yield was greater and the plots were able to withstand the drought conditions and the infestation from plant lice, whereas without the fall applications of fertilizer both the drought and lice caused great damage. The year's test also showed the value and importance of treating seed with Semesan before planting, and in tests with oats the use of Hormone fertilizers gave slightly higher yields and the plots looked better all winter. Apparently these plots started off quicker and tended to ripen earlier. These statements of results, it should be noted, are based upon one year's work and more testing will have to be done before conclusive results can be given. It is believed, however, that these statements are quite indicative as to what the future results will be.

Hay Tests: In a hay test with oats under the adverse conditions of the season the use of three bushels of seed to the acre proved superior to the use of two bushels, and even with barley three bushels of seed gave higher yield than two bushels to the acre, even though we had drought conditions during the ripening period. On the other hand, with barley, seeding grain and fertilizer simultaneously with a grain drill gave just as good yields as when the seed and fertilizer were put down into the ground separately; that is, in separate operations. This again is the result of one season's work and should be rechecked. In the fall hay crops it was also noted, as with grain, that the use of fall fertilizer was advantageous.

Lespedeza: Tests of real importance have been conducted with lespedeza on a fairly extensive basis. It was hoped that we might demonstrate that lespedeza could be used as the foundation legume forage crop for livestock in the Coastal Plain area. In the first year of the biennium, when weather conditions were favorable, a beautiful lespedeza hay crop was produced, but in the second year of the biennium, with drought in May, new seedlings of lespedeza were almost a complete failure and the old fields, while they produced a crop, were so retarded that the crop was short in growth and hay yield light. Since the southeastern Coastal Plain is subject to these spring droughts, it appears doubtful that lespedeza can be counted upon to fur-

nish forage and hay with certainty from year to year. It is a crop, however, which may be used advantageously at times when conditions are favorable. However, even at its best, the crop will not furnish hay of as good quality as alfalfa and it is deemed advisable to conduct tests to determine what may be procured in the way of results with alfalfa, using the very latest information which we have on the growing of this crop. With this in mind the station is seeding an alfalfa field and will be studying and testing this crop during the next biennium. With lespedeza some very definite information has been procured during the biennium. It was clearly demonstrated by lespedeza growing on plots which had formerly been in a fertilizer soil test and showing residual effects of continuous applications of certain fertilizers to certain plots, even after five years, that lespedeza responds remarkably well under our soil type to potash and where lime is used to an extent to cause the minor elements in the soil to become insoluble it is desirable to add these minor elements, especially manganese sulphate. The station found that by the use of basic slag as the source of phosphoric acid, lespedeza, and other crops as well, have benefitted from the oxides of minor elements in the basic slag.

DAIRY

*Cooperating with the Bureau of Dairy Industry, U.S.D.A.,
the N. C. Agricultural Experiment Station, and
E. W. FAIRES and A. O. SHAW.*

Our dairy project relates not only to dairying in Southeastern North Carolina, but throughout the entire Coastal Plain region of the Southeastern States. It has as its objective two major investigational problems. The first is the breeding program based upon the established purebred Jersey herd. This program aims to definitely establish or fix the inheritance factor for a high level of production by the use of proved-for-production sires. Falling under this investigation are herd management problems, herd health and herd production testing.

The second major investigation is the production of annual crops for grazing purposes, which crops are experimentally grazed to determine the grazing season or seasons, the yield per acre of calculated total digestible nutrients and the cost of production for such crops. Closely associated with this project is the maintenance of a satisfactory permanent pasture and the production of feeds, hay and silage for seasons when no crops are available for grazing.

A third investigation project relates to obtaining data on the reaction of Jersey cattle to existing climatic conditions, with particular reference to the effect on production during hot summer months. This work ties in with similar studies being conducted at other dairy stations throughout the United States.

The present cooperative arrangements for conducting dairy research at this station date back to 1939, at which time there were 51 females in the experimental herd of the station. These constituted the foundation female herd. They were sired by a group of eleven different sires. To date they have completed production records that average 8030.2 pounds of milk, 5.37 per cent butterfat and 431.2 pounds butterfat. The first generation bull to be put into service in the herd was May-Owl Tidvic Veda Toronto—344303. This bull, bred by the U. S. Department of Agriculture, Bureau of Dairy Industry at Beltsville, Maryland, had been proven for production in a herd where Dairy Herd Improvement testing was being practiced. This bull had 29 tested daughters that were out of tested dams. The 29 daughters averaged 8568.0 pounds milk, 4.96 per cent fat and 425.3 pounds fat. The 29 dams averaged 7730.9 pounds milk, 5.21 per cent fat and 403.2 pounds fat; the daughters, therefore, testing considerably better than their dams, thus proving the value of this bull at the time of his arrival. The services of this bull on to the foundation females of the herd has resulted in 45 females, 34 of which are now in the herd, and 42 males. Ten of his daughters have completed first calf records that average 7883.6 pounds milk, 5.43 per cent fat and 428.4 pounds fat. Basing observations only on the record of this bull's first ten daughters in the herd, there are indications that he will not increase the production level of the herd. It is believed, however, that he will not lower the herd level for production, but may increase it some as daughters now coming into milk and daughters milking in second lactations are producing at a higher level than the first ten.

Recognizing that the station herd is high in production the question may be asked what value is this to the community or the general section in which the herd is located? How can the farmer-breeder take advantage of such a breeding program? While no young female animals are sold out of the herd until a production record is obtained, older females are sold after securing their production records. During the past biennium, 23 such animals were sold as milking and breeding cows. The sta-

tion has a plan also for selling bull calves resulting from the breeding program. These bull calves are sold on a scale of prices based on the age of the bull calf and the production of its dam, and the scale is low enough to make every animal purchased a good bargain for the farmer. During the biennium 38 bull calves have been sold. These calves are out of dams that averaged 7649.7 pounds milk, 416.4 pounds fat, and the average sale price was \$23.95. They have been distributed into the following counties of North Carolina: Columbus, 16; Pender, 7; Robeson, 5; Sampson, 4; Duplin, 2; Lenoir, 2; Onslow, 1; and Wake, 1.

It is believed that as these bulls mature and are put into use in herds in these different counties they will materially improve the dairy stock and make dairying more profitable. The station herd has passed negative tests to both Bang's disease and tuberculosis and is, therefore, accredited as free from these diseases. In the fall and winter of 1942-43 several calves were lost two to three days following birth, the cause being acute diarrhea. This condition was corrected by the use of sulfaguanidine administered to the calf just as early after birth as possible.

The investigation of annual grazing crops is a "two crops annually" program. These crops are known as winter-spring and summer grazing crops. The average biennium results of this work are shown in the following table:

WINTER-SPRING CROPS

Crop or Crop Combination	Grazing Season	Total Standard Cow Grazing Days Per Acre*	Total Calculated T.D.N. Per Acre	Cost Per Acre
Oats, Barley, Vetch	Feb. 15-May 12	63	1014.2	\$12.93
Oats, Barley, Crimson Clover	Feb. 15-May 16	66	1056.9	12.51
Oats, Barley	Feb. 25-May 15	44	700.5	13.40
Italian Rye, Crimson Clover	Mar. 25-June 13	53	1056.3	9.80
Wheat	Mar. 15-May 21	68	1083.5	8.47

SUMMER CROPS

Soybeans	July 12-Aug. 25	44	701.1	13.44
Pearl Millet	June 18-Aug. 15	67	1070.0	11.00
Sudan Grass	June 28-Aug. 15	67	1072.4	9.10
Lespedeza	June 23-Oct. 1	68	1088.7	4.32
Kudzu	June 9-Oct. 2**	63	1002.2	7.60

Notes: * 16 lbs. T.D.N. standard cow day

** One year—1943.

The above crops or combination of crops form a series of annual grazing crops systems that may be compared one with

the other. The winter-spring combination crop of oats-barley-vetch is followed by soybeans for summer grazing. This constitutes one grazing system. Other grazing systems are oats-barley-crimson clover followed by pearl millet; oats-barley-crimson clover followed by lespedeza; oats-barley followed by soybeans; wheat followed by lespedeza; Italian rye grass followed by lespedeza; sudan grass has followed Southern Giant bur clover, and kudzu is a one crop system that supplies grazing only in the summer. Ladino clover, strawberry clover and Reeds canary grass, mentioned in previous reports, have been eliminated because of inability to become satisfactorily established. In addition to the annual grazing crops, and the pasture studies covered in the section on agronomy work, very satisfactory results have been obtained by seeding crimson clover on the established carpet grass sod. This has been beneficial in that early grazing has been provided, and there are indications that the grasses on this section of the pasture make better growth during the summer than sections where no clover is needed. Consequently the total yields have been materially increased from such management. Vetch that has been similarly seeded on permanent pasture has not proven to be as satisfactory. Germination was usually good but growth has been poor. Hop clover seeded on a small section of



Five cows were grazed from June 1 to November 1 on this 5-acre kudzu field at the Coastal Plain Station. The kudzu is also improving the soil on this area and serving as an emergency graining crop when other grazing is not available.

the permanent pasture where it was first established is gradually spreading over the pasture generally and is resulting in considerable improvement of the grazing offered, particularly the early spring grazing. As part of the dairy work of the station ensilage has been produced from corn and soybeans planted in the same row and from soybeans planted alone. Some difficulty has been encountered in the production of sufficient quantities of ensilage for want of acreage on the station property. Hay has also been produced in the spring from oats and vetch, and in the fall from soybeans and lespedeza. Here, again, there is some difficulty encountered in the production of sufficient quantities to supply the demand for winter feeding because of insufficient acreage. It is difficult to provide the dairy project with the acreage needed for pastures, pasture research, etc., and at the same time provide all necessary acreage for ensilage and for hay while at the same time affording acreage needed for other projects pertaining to horticulture, agronomy and other subjects. We endeavor, however, to adjust these matters to the best interest of all concerned.

SWINE

(D. P. SOUTHERLAND)

The swine project has been continued with considerable success. During the last biennium we changed over to Poland China from the Duroc Jersey breeding. This move was made because of the low number of pigs produced per sow. We procured from our Blackland Station sows from a strain which had a record of producing an average of seven weaned pigs per sow. A good boar was procured from another breeder and with this new stock we have been producing an average of at least seven weaned pigs per sow. We consider this to be the finest breeding of hogs we have ever had at this station and we are going forward with the program of selling weaned pigs to farmers in the section with a view to building the quality of hog stock in the area.

ENTOMOLOGY

Cooperating with the N. C. Agricultural Experiment Station.

Some entomology work has been under way on the station during the biennium in cooperation with the Experiment Station. Studies have been made on the control of red spider, especially

on strawberries, and some study has been undertaken on the corn bill bug and its control through plowing and planting at various seasons.

The station had satisfactory results from the use of Cryolite in the control of the velvet bean caterpillar on soybeans. The use of this chemical in liquid or dust form is a satisfactory means of controlling the infestation which is sometimes so severe that farmers speak of it as an attack of Army worms. This caterpillar, however, is quite different from the Army worm and attacks legumes, whereas the Army worm works by preference on grasses. Until recently it has been thought that it might be dangerous to use Cryolite on beans which would be used for forage, but some tests have been conducted recently which indicate that there is probably not as much danger as was at first thought. However, it would be well to use due caution until further tests have been made.

WILD LIFE CONSERVATION

Cooperating with the Department of Conservation and Development.

This project was interrupted due to the resignation of personnel, but has recently been revived. The project consists of planting such perennials as lespedeza sericea and other similar crops which afford good quail food. These crops are planted in strips along the hedgerows and to locations where they do not interfere with farming operations.

FORESTRY

This station has continued a forestry project in its woodland areas as a demonstration. This project has been continued through the biennium and has yielded to the station supplies of fire wood, pine needles for strawberry mulching, and timber.

MOUNTAIN STATION

Mountain Experiment Station (Original Location) Swannanoa, N. C.

Mountain Experiment Station (New Location) Waynesville, N. C.

Upper Mountain Experiment Station (New Location) Transou, N. C.

DEAN W. COLVARD, Assistant Director in Charge.

Area of Station—Waynesville Unit, 273 acres; Transou Unit, 410 Acres.

Elevation—Waynesville Unit, 2,800 feet above sea level.

Transou Unit, 3,300 feet above sea level (approximately).

At the beginning of the biennium the War Department was in the process of taking over the original location of the Moun-

tain Experiment Station for the construction of Moore General Hospital. An area amounting to 216 acres had been seized and the remaining area of 87 acres was in the process of being sold to private interests. This sale was completed and the property was incorporated as Swannaoa Valley Farms, Inc.

Immediate steps were taken to re-locate the station. A committee consisting of Commissioner of Agriculture W. Kerr Scott, Director of Test Farms F. E. Miller, Director of North Carolina Experiment Station L. D. Baver, members of the Board of Agriculture from the mountain area D. Reeves Noland and L. L. Burgin, Soil Specialist W. D. Lee, Farm Management Specialist representing the North Carolina Agricultural Extension Service and Tennessee Valley Authority R. W. Shoffner, and Assistant Director in Charge of the Mountain Station D. W. Colvard was appointed. An extensive study of farms in the mountain area was undertaken. Data relative to all types of agricultural production in the mountains was provided, and more than 100 farms throughout the area were inspected. Locations were considered in the counties of Buncombe, Henderson, Transylvania, Jackson, Haywood, Madison, Yancy, Watauga and Ashe. An effort was made to secure a farm meeting specifications described by all research specialists having work in the mountain area. This outline called for a farm of approximately 800 acres, at one location, and having typical and suitable soils and other physical features for all diversified farming activities in the area. Nearly two years were spent in the effort to locate a farm meeting these requirements and one which was at the same time available for purchase.

This study led to the conclusion that the whole area could best be served by locating the beef cattle and sheep work as well as certain other studies dealing with farming in the higher altitudes in the northwestern mountain counties and by locating the headquarters' farm more nearly the geographic center of the area which was in the vicinity of Buncombe, Henderson and Haywood Counties.

In the early spring of 1944 a farm meeting these requirements for the Upper Mountain area was located and found to be available in southeastern Ashe County. This farm consisted of 410 acres and was owned by W. M. Transou, Transou, North Carolina, and was being operated as a beef cattle and sheep farm, using Aberdeen Angus beef cattle and western grade ewes.

This farm was purchased subject to the fulfillment of cer-



New Upper Mountain Experiment Station, 410 acres, Ashe County. Located on N. C. highway 88, Transou, N. C.

tain outstanding agreements relative to the cutting of white pine timber and with the privilege of proceeding with its development until full possession by its former owner is relinquished in October 31, 1944. Its former owner, W. M. Transou, has exercised the privilege of using the main residence on the farm and in pasturing his livestock until October 31, 1944. Operations have been started and more than 30 stacks of hay have already been harvested. The first experimental work to be conducted on this farm was a planting of hybrid corns, made in early May, 1944.

A building program is underway at the time this report is being submitted. Barns for both beef cattle and sheep are being constructed. A new road connecting highway No. 88 with the Scenic Parkway is now under construction by the North Carolina Highway Department. This farm is being designated as "Upper Mountain Experiment Station."

A few weeks after the option was taken on the farm in Ashe County, another area, approximately one mile east of Waynesville in Haywood County, was found to be suitable and available. This farm consists of 273 acres and was owned by Mr. Grover C. Clark. He was operating a general farm including beef cattle, general feed crops, and was producing approximately eight acres of burley tobacco. After appropriate study by the Relocation Committee, an option was taken on this farm, and its purchase was approved by the Board of Agriculture. This option became effective June 1, 1944, and all growing small grain, corn and hay crops became the property of the station. A planting of silage corn was made immediately and appropriate steps were

taken to have the survey and the final legal transactions properly executed.

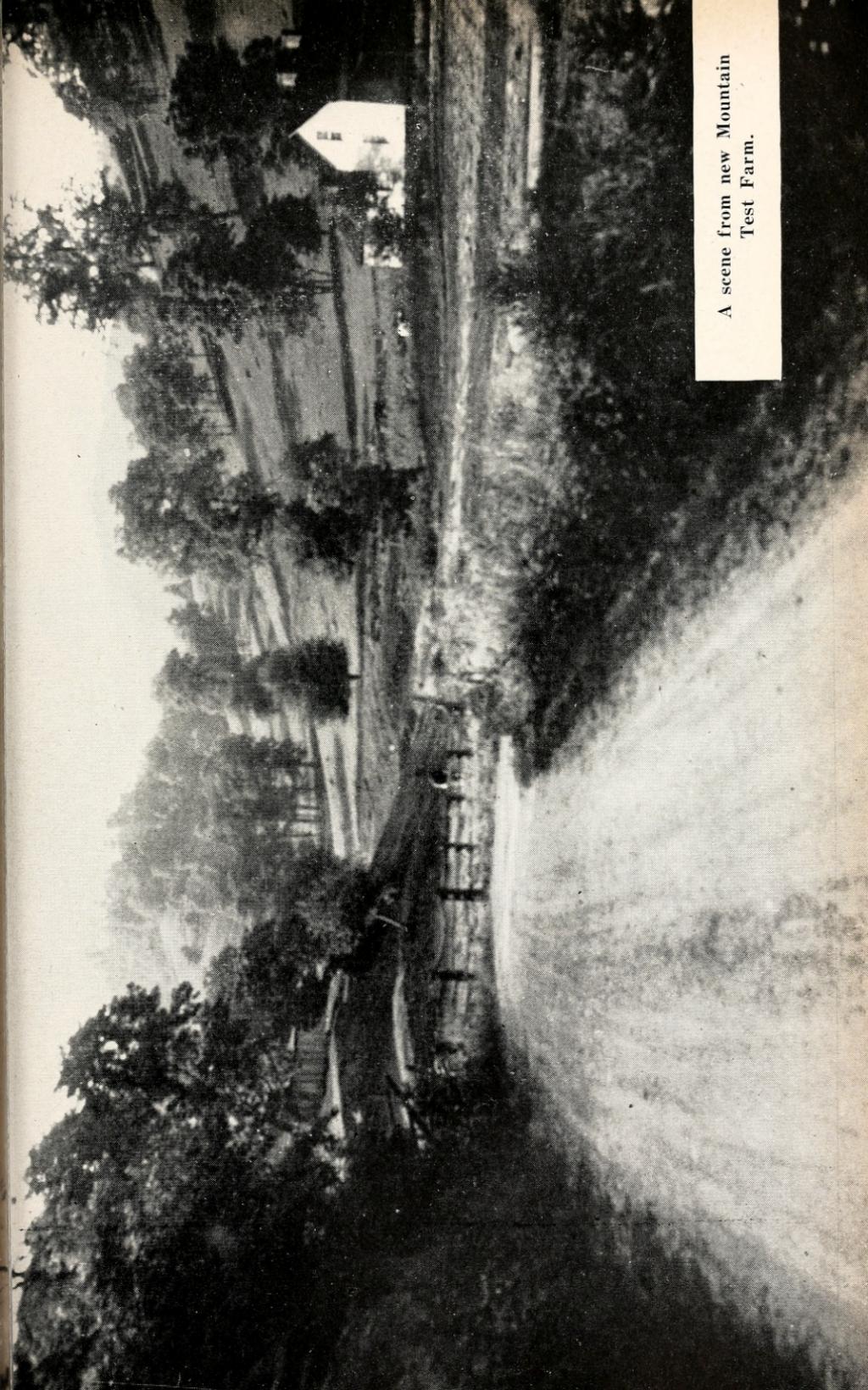
At the time of this report, construction plans are well underway at this farm, one tenant house having been repaired, and materials are now being delivered for the construction of the poultry and dairy buildings. Other construction contemplated includes burley tobacco barns, office and laboratory building, dwelling houses, and certain other structures. The first public meeting scheduled to be held at this farm was the Haywood County Guernsey Promotional sale held August 19, 1944, and sponsored by the Grade "A" milk producers of Haywood County, along with the County Agent and the Pet Milk Company.

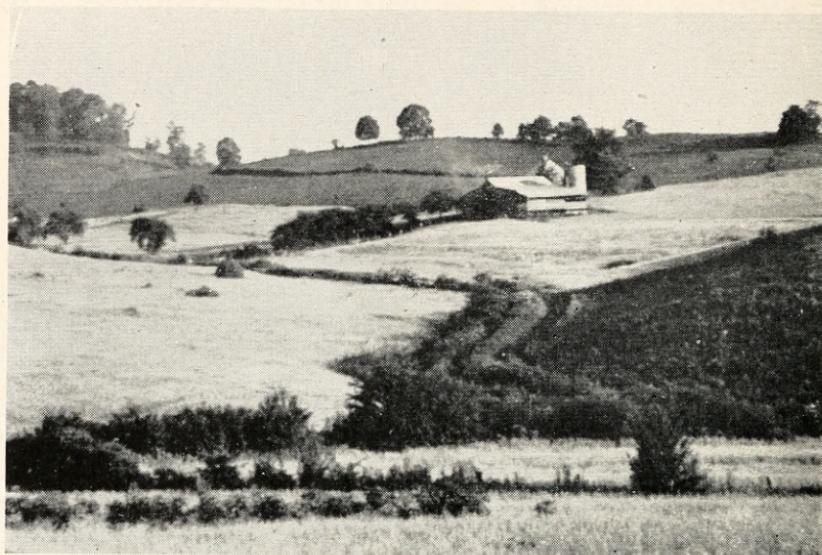
It is proposed that this farm will serve as headquarters for the Mountain Experiment Station program and that work conducted will include dairying, poultry, all field crops grown in the mountain area, and horticultural crops, including apples, small fruits, and vegetables.

A Federal appropriation has been granted for research with burley tobacco in the mountain area, and a research specialist, who will have headquarters at the Waynesville farm, has been employed. Work on this will be conducted at both the Waynesville and Transou Farms.

While efforts to relocate the Mountain Experiment Station have been foremost during the biennium, every effort has been made to carry on the research and the public service program to the fullest extent possible. Following the sale of the remaining portion of the Swannanoa Station, it was leased from its new owner, Swannanoa Valley Farms, Inc., for occupancy until the new station could be selected. At this location the dairy program was continued, hybrid corn and small grain plots were planted on leased areas. Certain experimental work was conducted on feeding hogs war emergency rations, and the public service features of the station were conducted from this location. The Poultry Division continued to operate on rented property near Candler, North Carolina, where it had been moved just prior to the beginning of the biennium. At the time this report is being submitted, the station is being operated from four points, namely, the original location at Swannanoa, now consisting of 87 acres, occupied under lease, the poultry farm near Candler, occupied under lease, the new Headquarters Station at Waynesville, recently purchased and being developed, and the Upper

A scene from new Mountain
Test Farm.





Views of the new Mountain Experiment Station. Located east of the city limits of Waynesville, N. C.



Station at Transou which was recently purchased and is now being developed.

A report of the experiments underway follows:

Poultry: Cooperating with the North Carolina Agricultural Experiment Station, comparison of Crossbred and Purebred

Broilers. (R. S. Dearstyne, C. H. Bostian and J. E. Love) : In 1942, 2,024 chicks were started and 1,663 broilers with wing bands were reared to 10 weeks of age. These broilers comprised 17 groups, with each group coming from a set of dams which had been mated with a male of the same breed and another male of a different breed. Without exception the crossbreds were heavier than their related purebreds. Rock-Reds averaged five and a half ounces heavier than Reds, and five ounces heavier than Rocks. Crossbreds having Leghorns as one parent were heavier than the related purebred heavies. Rhode Island Reds, Barred Plymouth Rocks, and White Leghorns were used, and six combinations of the crosses were made in addition to the three purebreds. Crossbreds had less mortality and showed a higher percentage completely feathered at ten weeks of age.

In 1943 the same breeds were used as in 1942. Thirteen group of crossbreds and purebreds were reared, starting with 1,225 chicks and finishing at ten weeks with 1,084 broilers alive and with wing bands. Again in every comparison, crossbreds were heavier than related purebreds, with the advantage ranging from one-half ounce per bird to 6.7 ounces per bird. Again crossbreds showed lower mortality and faster feathering.

In 1944 New Hampshires were used instead of Rhode Island Reds, along with the Barred Rocks and White Leghorns. From 1,471 chicks started, 1,225 broilers were reared to 12 weeks of age. Six N. H. sires, six Rock sires, and four Leghorn sires were used to produce New Hampshires, Rocks, Leghorns, Rock-Leghorns, Red-Leghorns, Rock-New Hampshires, and New Hampshires. The data have not been analyzed to date, but preliminary study shows that the pure New Hampshires were about as heavy at 12 weeks as their crossbreds, which were, however, heavier than the average of the parent breeds. It seems that as a pure strain the New Hampshires were superior to the other two breeds in broiler qualities to such an extent that their crossbred progeny were not superior to the N. H. parent, but were better than an average of the two pure breeds. This illustrates that the extent of hybrid vigor depends on the stocks crossed.

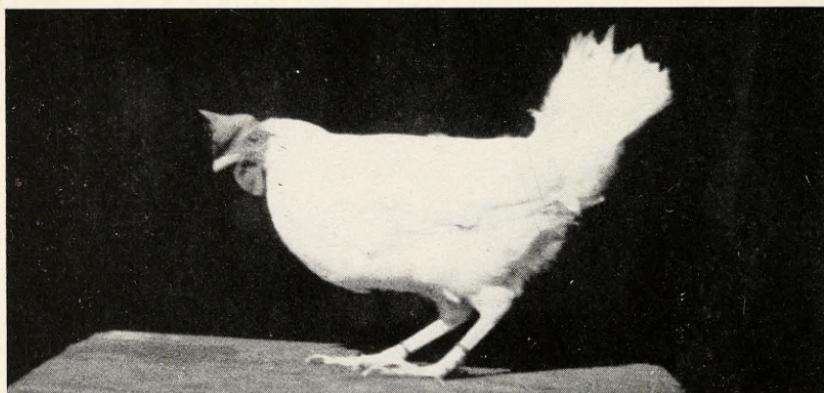
Comparison of Crossbred and Purebred Layers: From chicks hatched in 1942, 382 pullets were kept for layers. Comparisons were made for mortality before and after maturity, days to maturity (laying of first egg), production, broodiness, egg size, egg color and body weights. Crossbreds were not superior in every factor measured, but considering all factors were better than the

average performance of the two groups of related purebreds. Considering all factors which were measured, the groups of layers ranked as follows: Red-Leghorns, Leghorns, Leghorn-Reds, Rock Leghorns, Reds, Rock-Reds and Rocks.

Results indicate that the performance of crossbreds will be somewhat better than an average of the two parent strains, but not necessarily so, and that where one parent strain is a great deal superior to the other, the crossbred will not be as good as the better parent strain.

From chicks hatched in 1943, 417 pullets were kept as layers, and only recently (August 1) were culled. No analysis of the records has been made since production began, but at that time mortality had been lower among the crossbreds and sexual maturity earlier. When culling was done August 1, very few purebreds as compared to crossbreds had records which justified keeping them longer.

From the chicks hatched in 1944, around 450 pullets are being kept for comparison.



White Leghorn hen No. 388 laid 798 eggs to July 31, 1944. Her first egg was laid September 11, 1941.

One White Leghorn hen No. 388, bred and hatched at the College Farm in Raleigh in March, 1941, and sent to Swannanoa as a pullet, has laid 798 eggs to July 31, 1944. Her first egg was laid September 11, 1941, at the age of 173 days, and her picture is included in this report.

AGRONOMY

*Cooperating with the North Carolina Agricultural Experiment Station.
Small Grain Variety and Breeding Tests (G. K. MIDDLETON),
(In cooperation with the U. S. Department of Agriculture).*

A. Wheat—A uniform soft red winter wheat nursery consisting of 30 of the most promising varieties each year is planted and records are made of yields and of winter hardiness. The mountain area is desirable for testing winter hardiness due to its colder winters than in certain other parts of the State.

Beardless Thorne and bearded Fulcaster 151 are the highest yielding varieties for the mountain area and a registered and certified seed source is maintained by the station.

B. Oats—Spring oat variety tests have included 12 standard varieties and several new smut and rust resistant strains. One new spring variety, Marion, which has consistently yielded equal to the standard varieties, such as White Spring and Columbia, was planted in the spring of 1942.

A winter hardiness nursery consisting of 30 varieties is planted in cooperation with the U.S.D.A. The Letoria, Fulwin and certain other varieties are developing sufficient winter resistance to withstand considerable cold weather and have been found to produce 150% as much total digestible nutrients per acre as barley. Breeding and selection for increased winter hardiness are underway, and it is expected that varieties with more resistance will be available as the experiments progress.

C. Barley—A winter hardiness and variety nursery and also certain hybrids for selection studies have been planted. Fifty bulk hybrids and five composite hybrids have also been studied. There is a rapidly growing interest in the use of barley for livestock feed in the mountainous area, and the station is prepared with information as to the highest yielding varieties. Iredell and Sunrise varieties are being recommended.

Official Variety Tests (R. P. Moore) (In Cooperation with the North Carolina Crop Improvement Association): These tests include varieties of corn, wheat, oats, and barley for which application for registration or certification is made. Data is secured to determine whether a variety may be registered or certified and sold as seed in the mountain area.

Hybrid Corn Tests (P. H. Harvey): As a continuation of the breeding program with hybrid corn increases, numbers of hybrids have been tested for production under mountainous

conditions. Several of the hybrids having highest yields at the Mountain Station are in production by farmers in every county throughout the area, and yields of 15 to 25 per cent above standard varieties are being harvested in many sections. Farmers are becoming more and more informed concerning the proper use of hybrid corns, and it is anticipated that within the next biennium tremendous increases in the planting of these corns will be experienced.

HORTICULTURE

All horticultural work was discontinued when the orchard and vineyards were taken by the War Department but will be re-established at the new locations. An apple orchard consisting of 300 trees of Delicious and Stayman at the Transou farm is being prepared for experimental studies at the beginning of 1945.

DAIRY

Cooperating with the North Carolina Agricultural Experiment Station,
A. O. SHAW, R. E. COMSTOCK, S. M. CORRELL.

Roughage Feeding Studies: Studies have been underway comparing milk production of cows fed on heavy grain and low hay rations with that of those fed on heavy hay and low grain rations. It was found that satisfactory milk production can be maintained with relatively small quantities of grain and that the cost of the production where hays are home grown is much lower.

Breeding Studies: A breeding program in which no bulls will be brought in from outside sources has been worked out. Careful selection will be practiced and an effort will be made to breed animals as near homozygous for both good type and good production as is possible.

The herd of Jerseys at this station has been officially classified for type during the biennium, and on the second classification the herd sire and one cow were made "Excellent." To receive the "Ton of Gold" award a cow must produce a ton or more of butterfat in four consecutive years. Two cows have received this award during the biennium.

HOGS

*Cooperating with the North Carolina Agricultural Experiment Station,
A. O. SHAW, E. H. HOSTETLER.*

When the Government made available large quantities of feed wheat, little information was available as to its relative value as a feed for hogs. An experiment was set up providing 10 pigs in three different groups, one group being self-fed on whole yellow corn, the second group being offered free choice of whole yellow corn and ground wheat, and the third group being self-fed on ground wheat. It was found that pigs may be fattened equally as quick on wheat as on corn and that pigs consuming ground wheat consumed less protein supplement than those consuming corn. Pigs offered free choice of both corn and wheat consumed six times as much wheat as corn.

PUBLIC SERVICE

Public service features of the program have been continued with many farmers calling and writing for information. No field days have been held due to war conditions, and public meeting initiating the program at the Transou farm has been postponed due to an epidemic of infantile paralysis during the summer of 1944, but will be held later in the year.



DR. WILLIAM E. MOORE

VETERINARY DIVISION

DR. WILLIAM MOORE

BANG'S DISEASE

As previously reported, we completed on July 1, 1942, the Bang's testing of all cattle in all of the counties in the State over six months of age and all counties were placed in the modified accredited Bang's free area, which indicates that Bang's infection has been reduced to one per cent or less in all of the cattle throughout the State. Since that time, we have continued to test herds that were known to be infected, herds in which it was suspected that infection might exist, herds owned by the State and by charitable institutions, herds to which imported cattle have been added, and others.

The following shows the number of herds and cattle officially tested by Federal, State, City, and practicing veterinarians each month during the two-year period, together with the number of reactors found:

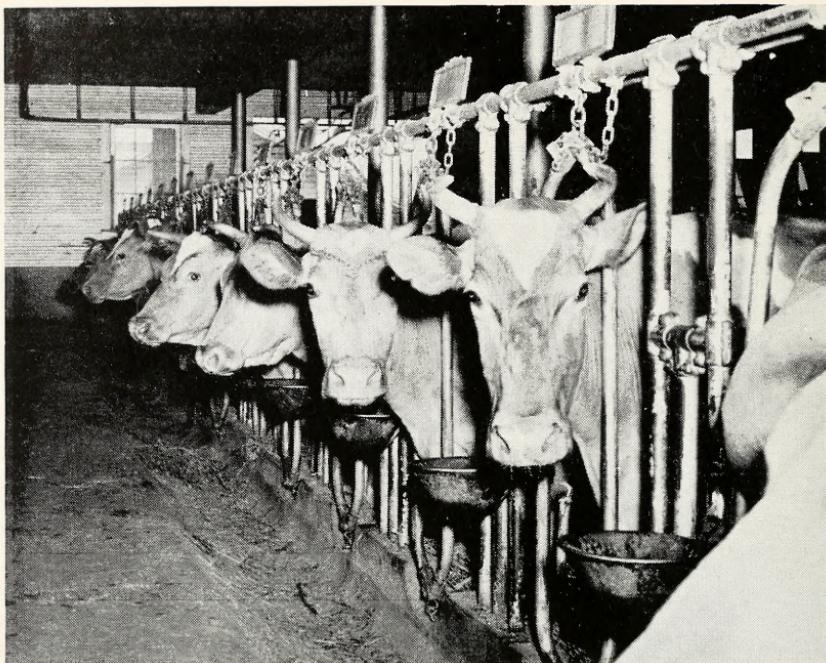
Date	Herds	Cattle	Reactors
July, 1942	621	9,336	97
August	840	10,446	72
September	659	7,870	82
October	721	8,982	74
November	537	9,798	70
December	294	6,382	88
January, 1943	492	9,712	55
February	515	9,585	85
March	801	10,879	140
April	1,011	14,315	112
May	1,117	14,349	140
June	801	10,415	172
July	868	12,079	128
August	886	12,246	87
September	765	10,335	97
October	729	12,606	98
November	770	11,558	60
December	472	7,850	34
January, 1944	629	9,890	81
February	490	11,658	116
March	649	13,730	105
April	611	15,425	148
May	559	13,241	211
June	425	10,454	203
	16,262	263,141	2,555



Taking blood samples for Bang's disease test.

It will be noted from the above that the percentage of reactors is less than one per cent, notwithstanding that a large amount of this testing was done in infected herds. It is therefore safe to assume that the percentage of infection in the cattle throughout the entire State is much less than one per cent. During this time we have also re-tested and re-accredited a large number of individual herds and we now have more than 500 Bang's accredited herds, many of which were previously infected. The infection in these herds has been eliminated by good herd management and by the application of the Bang's test. It has also been necessary to do considerable testing in certain counties in order to re-accredit same, since it is required that every three years previously infected herds or herds in which it is believed that infection may exist, shall be tested in order that the county can be re-accredited.

Due to the greatly increased demand for both milk and meat, there has been a considerable movement and exchange of cattle, and the cattle population has greatly increased. The regulations adopted by the Board of Agriculture in October, 1942, requiring that all cattle, except those for immediate slaughter, brought



A section of a sanitary milking barn.

into the State, shall come from negative herds only, have greatly reduced the number of infected animals that would have been brought in had this regulation not been in effect. However, we realize that there are still many animals transported into the State by trucks, which do not have proper tests and health certificates.

We have also made considerable effort to prevent the spread of Bang's disease through the public livestock markets of the State; and by testing and careful inspection, we have greatly reduced the number of reactors that might have come from the markets to the farms.

Many herds have become infected or the infection has spread in the herd due to the labor situation and poor herd management.

Much publicity has been given to vaccination with the Strain 19 vaccine. Much research and experimental work has been done in connection with this vaccine and the vaccine has been approved for use in calves between the ages of four and eight months. This vaccine contains large numbers of live Bang's organisms which have been reduced in virulence but are still

alive. It has been found that this vaccine produces considerable immunity when given to calves between the ages of four and eight months, although it fails to protect all of them and in some instances results in permanent infection of the animal; and such an animal becomes a permanent reactor. We have approved this vaccine in so-called problem herds—that is, herds in which we continue to find reactors on frequent tests, although a great many of these herds probably remain infected because of poor herd management. We believe that this vaccine should be used in calves only, under strict supervision and with great care. But if so used, we feel that it does offer considerable protection to the animal and will assist in eliminating the infection from a herd.

There has been some agitation for the vaccination of adult animals. Some research and experimental work is being done along this line in other states, but there is no scientific group which at this time recommends this vaccine for mature animals, and in view of the fact that we have a very low percentage of infection, we believe at this time that it is unwise to vaccinate mature animals. When mature animals are vaccinated, a large number of them become permanent reactors and no test has been perfected that will tell the difference between a reaction resulting from vaccine and one resulting from natural infection. We are very much opposed to promiscuous vaccination for this reason and, further, that it has not been proved by research and experimental work that it offers proper protection or is a safe procedure. While it is claimed that this vaccine is not dangerous to man, this has not been scientifically proved. All informed persons agree that a Bang's free herd should be the ultimate goal of all herd owners but there is a difference in opinion as to how this might be attained. We know for a fact that no animal disease has ever been eradicated by using a live vaccine. We have the results of the use of a live vaccine in the case of hog cholera, which to some extent has been controlled but is still widespread.

While Bang's disease is not considered a major public health problem, the fact remains that it can be and often is transferred to man, resulting in a rather serious disease. Bang's disease causes sufficient economic loss to justify the expense and trouble of eliminating it from our herds. It has been very definitely shown that it seriously interferes with production and reproduction. The test and slaughter method of controlling Bang's disease is, of course, expensive and in many instances works a

severe hardship on a herd owner, but experience over a period of years certainly indicates that this is the best method of controlling this disease in a State where the percentage of infection has been reduced to a very low point, as in the case in this State. Perhaps in the future a vaccine may be developed that will prevent Bang's disease without the danger now attached to our present vaccine, but until this is developed, I think it would be a great mistake to use a product that has not been proved by leading scientific groups.

This work has been conducted in cooperation with the U. S. Bureau of Animal Industry, and we have received full cooperation.

HOG CHOLERA AND OTHER SWINE DISEASES

There has been about the usual amount of hog cholera and other swine diseases during the period covered by this report. There have been some outbreaks of cholera that have been satisfactorily handled by proper control measures. The matter of hog cholera and other swine diseases has been recently discussed at length in previous reports. This is a matter to which we have given a lot of thought and study. We believe that the following policy, which we have adopted as far as possible for the control of swine diseases, is to the best interests of all concerned:

1. Control the movement of hogs that are infected with or exposed to disease.
2. Investigate outbreaks of disease, applying such measures as are deemed necessary to prevent the spread of disease.
3. Regulate and supervise public livestock markets with a view to preventing the spread of disease.
4. Encourage the temporary segregation of newly acquired animals.
5. Encourage the control of parasites by the practice of swine sanitation and the use of other scientific methods, the feeding of balanced rations, the feeding of proper minerals, and by proper housing.
6. Dispose properly of dead animals.
7. Discourage the feeding of raw garbage.
8. Make laboratory diagnosis of doubtful cases.
9. Restrict the use of virus.
10. Limit serum-virus treatment to qualified veterinarians only.
11. Discourage the promiscuous use of virus in healthy non-exposed herds, especially in communities where cholera does not exist; in herds improperly fed and managed; in unthrifty herds; and in herds kept under insanitary conditions.
12. Investigate the unlawful use of virus.

The 1943 General Assembly enacted a law for the control of hog cholera and other swine diseases, which has been of some assistance. It also provided for additional inspectors, but due to the fact that a very large number of veterinarians have been

called into the military service, it has been impossible for us to secure a sufficient number of veterinarians to carry out properly this program. The enforcement of the provisions of the public livestock market law, especially the provisions for vaccination and health certificate, has greatly reduced the spread of disease from these markets.

This work has been conducted in cooperation with the U. S. Bureau of Animal Industry and these officials have given us full cooperation.

ANTHRAX

In August, 1943, we encountered an outbreak of anthrax on three farms in Mecklenburg County. This disease originated on one farm and had spread to two other farms before it came to our notice, the spread probably resulting from the failure to dispose properly of animals that had died of anthrax. A total of twelve animals had died on these three farms at the time we were notified of the outbreak. All of the remaining animals on the three farms were promptly vaccinated and no further loss occurred. All of these were dairy farms and it was necessary to quarantine the farm and to stop the sale of milk for several weeks. All of the animals on these farms were vaccinated in the spring of 1944 and again during midsummer. No losses have occurred this year.

A careful investigation as to the probable cause of this outbreak was made. It was found that on the farm where the original outbreak started, that they were feeding a mineral mixture containing bone meal which had been produced in Argentina. We are of the opinion that this bone meal was responsible for this outbreak. It has been necessary to re-vaccinate the animals on the farms where outbreaks occurred in 1941 and previous years. Anthrax is caused by an organism that may live, under proper conditions, for many years, making it necessary to vaccinate all animals each year for an indefinite period.

CATTLE FEVER TICK

No cattle fever ticks have been found during the period covered by this report, notwithstanding that we have made a very large number of inspections in all sections of the State. Cattle fever ticks have not been found in North Carolina since 1931, at which time they were found in Sampson and adjacent coun-

ties, but by proper inspection and dipping, they were completely eradicated.

BOVINE TUBERCULOSIS

Work in the control of this disease has been confined to the testing in counties in which the three-year accreditation period has expired, to State owned herds, herds of charitable institutions, herds to which imported cattle have been added, herds known to be infected, purebred herds, commercial herds, and other herds.

The following is a summary of the testing done by Federal, State, and practicing veterinarians during the period covered by this report:

<i>Date</i>	<i>Herds</i>	<i>Cattle</i>	<i>Reactors</i>
July, 1942	269	3,101	0
August	162	3,871	29
September	122	2,997	8
October	85	1,520	0
November	145	2,170	6
December	203	5,009	0
January, 1943	296	2,912	0
February	76	2,461	0
March	275	4,871	1
April	203	4,424	0
May	247	3,399	0
June	245	3,857	0
July	129	3,272	0
August	156	2,983	0
September	247	4,459	0
October	297	4,904	0
November	104	3,157	0
December	126	1,987	3
January, 1944	165	2,339	0
February	164	3,731	34
March	178	3,806	6
April	97	4,431	0
May	230	7,177	0
June	203	4,954	8
	4,424	87,792	95

This is the largest number of reactors in a two-year period that we have found in the past fifteen years. Practically all of this infection occurred in four herds which the owners failed to have tested regularly and in one herd many animals had been added without a proper test. This indicates the necessity for constant vigilance because so long as tuberculosis exists, we may expect to find it in our herds unless we use every precaution to prevent it.

PULLORUM DISEASE CONTROL, HATCHERY AND FLOCK INSPECTION, AND BREED IMPROVEMENT WORK

Satisfactory progress has been made in this program during the period covered by this report. As in the past, this work has been conducted under the National Poultry Improvement Plan. For the season 1943-44, we found it necessary to completely change our method of handling this program, due to our inability to secure a sufficient number of inspectors to do the work and also on account of the greatly increased demand for this work. Under the new program, the hatcheries supply an inspector to do the testing and flock selecting. A testing school was conducted at State College prior to beginning the work, at which intensive instructions were given these testing agents. This division furnished three full-time inspectors—one to supervise the entire program, one to supervise the work in the east, and one to supervise the work in the west. We also furnished two temporary inspectors to do the testing for some of the hatcheries, especially the testing and selecting for the smaller hatcheries that were unable to have testing and selecting agents.

The following table shows the number of flocks and birds tested, together with the percentage of reactors. The work for the three previous years is also given for comparison.

Year	Number Flocks Tested	Number Birds	% React.	Number Birds	% React.	Total Samples Tested, Includ- ing 3d & 4th	% React.
1939-40	1,785	394,383	1.99	195,289	0.75	589,672	1.78
1940-41	1,706	382,475	1.509	129,382	0.97	511,857	
1941-42	2,308	568,340	1.306	72,174	0.98	640,514	
1942-43	2,290	557,710	1.01	37,688	0.90	595,398	
1943-44	2,874	722,181	1.31	117,481	0.96	842,750	

While the percentage of pullorum infection is quite low, it is generally recognized that this work must be continued in order to keep the infection under control. Under our present program, we are able to give more attention to flock management and breed improvement, which is an important part of the work. Due to the great increase in the demand for this work, we find that the three inspectors now employed cannot satisfactorily take care of this work and we are requesting in the budget for the next biennium the employment of an additional inspector.

RABIES

This division has continued to operate under the State Rabies Law, Chapter 122, Public Laws 1935, as amended by Chapter

259, Public Laws 1941. As a result of the amendments of 1941, the requirements are largely carried out by the local county government. We have continued to furnish vaccine to authorized inspectors, as is required under the law. The following shows the amount of rabies vaccine distributed each year during the past five years: 1940, 4,000 doses; 1941, 4,118; 1942, 3,760; 1943, 2,010; and 1944, 3,050.

There are only a small number of counties that operate under this law and many of these secure vaccine direct from the producer.

As stated in previous reports, we doubt if the trouble and expense can be justified in vaccinating all dogs in counties where rabies is not prevalent. We believe that the strict enforcement of this law in areas where rabies does exist will result in greatly reducing the disease. Considerable trouble has been experienced in several counties where rabies has occurred in foxes and has been spread by them to dogs and livestock.

EQUINE ENCEPHALOMYELITIS

This disease affecting horses and mules, resulting in paralysis and death in a short time, has not been prevalent during the period covered by this report, although a few cases have been reported. A very satisfactory vaccine has been perfected for the prevention of this disease. This is a virus disease which, it is believed, is transferred by biting insects, but complete information on this is not available.

DIAGNOSTIC LABORATORY

This laboratory was established on July 1, 1940, and was continued for a period of nearly two years. In the spring of 1942, Dr. M. A. Schooley, who was in charge of this laboratory, accepted an attractive offer with the University of Illinois and was later called into the Army. On account of the great demand for veterinarians in the military service, we found it impossible to secure a satisfactory veterinarian to continue the laboratory work. We believe that this is a very important piece of work and that it should be continued as soon as a suitable man can be secured. There are many diseases of livestock which it is impossible to diagnose at times without the facilities of a diagnostic laboratory.

PUBLIC LIVESTOCK AUCTION MARKETS

We have continued to enforce the 1941 law covering livestock markets. This law was amended by the 1943 Legislature by taking from the Commissioner of Agriculture all discretion as to the granting of permits for such markets. Under the present law, the Commissioner is required to grant a permit upon application, and the authority for cancelling such permits is vested in the Board of Agriculture after giving the operator an opportunity to be heard. This is a costly and somewhat unsatisfactory provision since the members of the Board of Agriculture live in widely separated sections of the State and meet only occasionally. Under the amended law, the Commissioner is authorized to apply to the courts for an injunction to close the market in the case of markets that continue to operate in violation of the law and regulations.

During the period covered by this report, it has been found necessary to have hearings for three operators that continually failed to comply with the law and regulations. Improvement has now been made in all three of these markets and it is hoped that they will so operate in the future as not to make it necessary to have further hearings.

The law was strengthened in 1943 as to certain other provisions which it is believed will further prevent the spread of livestock diseases by animals passing through these markets. There is now a total of thirty-three markets operating under the law. Many of these operate on a large scale and we realize the difficulties of operating these markets under the present manpower shortage, but we feel that it is quite necessary that these markets reasonably comply with the law and regulations in order to control the spread of livestock diseases.

MASTITIS

When the diagnostic laboratory was set up in 1940, we had in mind the operation of a mastitis control program in connection with this laboratory, but not being able to continue this, it was necessary temporarily to abandon this program. Mastitis is an acute or chronic inflammation of the udder and is a very serious disease of dairy cattle. A considerable amount of research and experimental work has been done by the Federal and by many State Experiment Stations. However, no simple method of preventing or controlling this disease has been perfected.

Many treatments have been recommended but none of these are entirely satisfactory. No simple test has been perfected for this disease. However, by proper veterinary inspection, much can be done to reduce the loss sustained from this disease. Treatment seems to be effective in early cases but in advanced cases where structural changes have taken place, there is not much that can be done. This is another disease in which herd management plays a large part in the prevention and control of the disease. We believe that a program of carefully examining all cows in a herd and providing treatment where this is believed necessary will do much towards controlling this disease and in enlightening the owner or herdsman so that they will be in a position to supply better herd management which is so important in the prevention and control of mastitis. We have requested funds to begin such a program, which we hope can be inaugurated as soon as sufficient veterinarians are released from the military service.

MISCELLANEOUS

We have a very large number of requests to investigate reports of outbreaks of disease. It has not been possible for us to take care of all of this because of the greatly increased amount of laboratory and other work and due to a lack of personnel. Many of these requests for assistance are for a purely personal service that could be taken care of at less expense and entirely satisfactorily by the local practicing veterinarian. This presents one of the most unpleasant problems with which this division has to deal. Many livestock owners apparently believe that the State should supply them free and prompt veterinary service for all occasions. This, of course, is impossible and, I think, undesirable. We have followed the policy of investigating, so far as time and funds will permit, those reports that indicate that a serious contagious disease exists that without help might spread and seriously affect the livestock industry, and investigations are also made when a large number of animals are affected and the cause cannot be determined.

We are glad to report that no sheep scabies, or glanders have been encountered during the period covered by this report, although these diseases have previously existed in this State and we are constantly on the lookout for them. A few isolated cases of blackleg have been reported. Infectious keratitis, a serious

disease affecting the eyes of cattle, seems to be on the increase. Much of this was brought in by E.R.A. cattle, and livestock markets are responsible for much of the spread of this disease. A satisfactory method of control has not been worked out. Johne's disease, or paratuberculosis, has not been encountered.

We have continued to look after the health of livestock on the twenty-two State-owned farms and have made considerable effort, with success, to prevent disease among the livestock. We have continued to look after the health of the livestock on the prison farms and have found it necessary to keep all of the hogs vaccinated. Practically all of the prison camps have more or less farm land and on nearly all of them hogs are produced. Since all of these camps feed garbage from the prison kitchen, which is a prolific source of cholera, we believe that it is essential that these hogs be immunized against cholera. We have, therefore, inaugurated a systematic plan of vaccinating all of the hogs at these camps.



A. B. FAIRLEY

WAREHOUSE DIVISION

A. B. FAIRLEY

The State Warehouse System during the biennium 1942-43 and 1943-44 licensed 97 warehouses with storage capacity of 572,000 bales of cotton. This is a decrease in the number of warehouses licensed, but is an increase in total capacity.

During the year 1943-1944, the warehouses handled 472,164 bales. This is something over 70% of the 1943 crop, and speaks well for the warehouses, as they have been considerably handicapped by the shortage of labor. They have also had

to handle cotton on a smaller margin of profit, due to the increased cost of labor and an increase in insurance rates. Several of the smaller warehouses have been forced to cease operation due to a lack of labor and of profit. We still have a sufficient number of warehouses, however, to handle the crop of the State under ordinary circumstances.

Through the cooperative agreement with the Federal Government we have been able to continue the classing of cotton. We have not had a State classer since last October, but the Federal Department has classed all State cotton in addition to the Government work.

The cotton gin service was discontinued in October, 1943, due to the fact that our gin inspector accepted a position with the Federal Government. The 1943 crop showed an increase in gin-damaged cotton and we feel that some of this was due to our not having a gin inspector to work with the ginners. A new gin inspector was obtained, beginning work on July 1, 1944. We feel that through his efforts and the coordination of other cotton groups and agencies better ginning will be obtained for the 1944-45 season.

The weight-testing truck has been in operation and gin scales were tested by the Weights and Measures Division.

The warehouses at Norlina and Benson were operated and brought good revenue to the State.

The majority of the warehouse companies owing money to the State on loans have made substantial payments and the total

amount due on mortgages has been reduced by \$14,000. During the biennium, the State Warehouse System purchased \$82,500 worth of U. S. War Bonds.

Below we list the amount of interest collected during the biennium, and also the financial standing of the State Warehouse System:

Interest	\$51,107.51
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	Cash on Hand Principal Fund	Cash on Hand, Supervision Fund	Loans 1st Mortgage	Invested in Bonds
1942-43	\$67,761.33	\$46,805.93	\$250,703.45	\$324,500.00
1943-44	6,554.21	54,669.57	246,305.57	390,000.00



C. D. BAUCOM

WEIGHTS AND MEASURES DIVISION

C. D. BAUCOM

The activities of this division can best be apprehended by a study of the following table:

	Ap- proved	Con- demned	Confis- cated	Re- leased	Total	App'ved Perc'ge 1942-44	App'ved Perc'ge 1934-36	Perc'ge Improve- ment
Scales -----	36,764	3,513	293	1,414	41,984	87.5	76.8	10.8
Weight -----	22,292	---	968	---	23,260	95.8	87.6	8.2
Dry Measures ----	472	---	41	---	513	92.0	76.5	15.5
Liquid Measures --	18	---	25	---	43	42.0	87.3	---
Packages -----	211,118	42,328	---	---	253,446	83.3	70.2	13.1
Deliveries -----	1,501	50	---	---	1,551	96.7	88.0	8.7
Kerosene Pumps --	771	---	---	---	771	---	---	---
GRAND TOTALS -----	272,936	45,891	1,327	1,414	321,568	---	---	---
Number of Places Visited -----							18,903	
Number of Prosecutions -----								50

You notice that we have made a comparison with our Biennial Report of 1934. This was done in order to show that marked improvement has been accomplished.

The purpose of this division is, as stated in the first section of our law, namely—"To protect the purchaser of any commodity" In so doing, our inspectors visited 18,903 places of business and made a total of 321,568 inspections. In addition to this, we make numerous investigations upon complaints coming from various sources. Sometimes these complaints are well founded; whereas, others are not. Nevertheless, we cannot ignore any which are duly signed.

Four of our inspectors are now in the armed services and during the past few months we have not been able to obtain our full quota of personnel, due to inability to employ men having the necessary qualifications at the salary granted.

During the past year, we have converted a Ford truck which was formerly used in testing the pulling power of horses and mules, into a heavy duty scale testing outfit suitable for testing livestock scales and other types in the mountainous section of our State. This piece of equipment has been needed for a long while.

The enforcement of the Weigh Master Act has brought very satisfactory results to all parties concerned. This act includes all weighers of tobacco, cotton, peanuts and livestock at public auction markets.

The enforcement of the Scale Mechanic Act has been considerably handicapped due to the scarcity of scale mechanics. The number of registered mechanics is about one-half of what it was two years ago.

The Board of Agriculture recently established a standard of measure for wood to be known as the cord, which reads as follows: "The term 'cord' shall be construed to mean a quantity of wood consisting of any number of sticks, bolts, or pieces laid parallel and together so as to form a rick, stack, or pile occupying a space 4 feet wide, 4 feet high and 8 feet long, or such other dimensions that will, when multiplied together, equal 128 cubic feet by volume, construed as being 70% solid and 30% air space, or 90 solid cubic feet."

In post-war planning, we hope to increase our activities so as to re-employ all of our men who are now in the armed services of our country, and thereby be able to carry out the intent of the law in accordance with the provisions thereof. As yet, we have not had sufficient personnel.

ABOUT THE STATE FAIR

By DR. J. S. DORTON, *Director*

Due to the war and the consequent restriction on travel, no State Fair was held during this biennium, and the buildings at the fairgrounds were rented out for a substantial return.

Tentative plans have been drawn up for a State Fair in the fall of 1945.

Although the State Fair division has not been active, long-range plans for the erection of a coliseum and a general expansion of livestock facilities for the Fair after the war have received the attention of the agricultural and political leaders of North Carolina.

Had the war not occurred, improvements to the State Fair would probably have been effected by the end of 1944, for Governor J. M. Broughton expressed his disappointment with livestock exhibition facilities and promised to use his influence toward the construction of more buildings. Architect's plans for improvement to the grounds and for the coliseum were completed in the fall of 1940.

New buildings are needed for exhibition of horses, poultry, sheep, dairy and beef cattle, and dormitories should be constructed for boys and girls and their parents who bring animals to the Fair.

The following committee has been named by Commissioner of Agriculture Kerr Scott to draw up more definite plans for an enlarged State Fair: W. W. Fitzpatrick, Rougemont, chairman; L. B. Jenkins, Kinston; Horton Doughton, Statesville; C. L. Ballance, St. Pauls; Tom Moss, Youngsville; T. A. Horne, Burlington; Harry B. Caldwell, Greensboro; Flake Shaw, Greensboro; W. S. Murchison, Raleigh; J. B. Speight, Winterville; and Mrs. H. H. Davenport, Mackeys.

STATE MUSEUM

HARRY T. DAVIS

The World War has largely shaped the policies and activities of this museum during this biennium. The educational function of presenting the natural history and natural resources of North Carolina has been fitted into the war effort. This has meant certain curtailments and adjustments to fit priorities, but it has brought an opportunity to present our exhibits to a cosmopolitan adult group in uniform, and their visiting relatives. We have been able to improve the presentation of old exhibits and to add appropriate new exhibits. This has been especially true since January, 1944, when Governor J. M. Broughton made it possible for us to have skilled and unskilled labor from the Prison Division of the State Highway and Public Works Commission to clean and paint the interior of our old building.



HARRY DAVIS

ACCESSIONS

This is the stuff of which both exhibits and a body of factual information are built. For obvious reasons not all accessions find a place in a systematic plan of exhibits. The current search for strategic and critical war materials has emphasized the value of specimens that have been recorded in detail and placed in systematic storage.

Significantly, the major petroleum companies that are planning an exploration and drilling program in our coastal plain have made extensive use of 10,952 fossils, with data, collected during our previous biennium. This survey was made with the cooperation of the Academy of Natural Sciences and American Philosophical Society, Philadelphia. Dr. H. G. Richards, paleontologist, actively represented these institutions.

Travel during the biennium has been severely restricted to that serving war needs, or where otherwise necessary. This obligation was observed and it is reflected in a smaller total of accessions, and less field work.

Below is given a summary of accessions for the biennium. Major accessions are noted below this summary.

Accessions by groups were: Rocks and minerals, 207; forestry and botany, 12; invertebrates, 33; fishes, 30; reptiles and amphibians, 107; birds, 113; mammals, 62; archaeology, 424; agriculture, 14; library volumes, 104; bulletins and pamphlets, 584; pictures, 96; and lantern slides, 24. Total: 1,810.

More significant accessions were:

July, 1942: Mica and accessory minerals collected from Wake and nearby counties, and fossils and marl collected from Craven and Carteret Counties.

September, 1942: A well preserved cotton carding and spinning outfit, dated about 1847, from Mrs. L. H. Dupree, Willow Springs.

October, 1942: A large octopus from Carolina Beach, by J. R. Baggett.

February, 1944: An albino opossum from Davie County, by S. M. Call and Senator B. C. Brock.

An early type cotton gin, from L. L. Edgerton of Goldsboro.

May, 1943: A prehistoric Indian grinding mortar of the rare lithia mica, by Martin Fowler of Warren County.

The new North Carolina mineral heubnerite collected from the Hamme Mine site that has been developed as an important source of tungsten for critical war uses.

The skins of the Herring Gull "Kaiser" and his mate, from Dr. Ben F. Royal, Morehead City. This gull lived a record of forty-eight years.

June, 1943: A very old—70 years—Cherokee Indian basket and cooking pot, by William F. Tyndall of Cherokee.

Five reproductions of artists' paintings depicting the production of tobacco, by the American Tobacco Company.

An albino gray squirrel, and a normal one, from Fred N. Colvard of Jefferson.

July, 1943: A live canebrake rattlesnake, from U. B. Blalock of Wadesboro.

November, 1943: Old script drawings to illustrate the growing and use of tobacco by American Indians in 1590, by Walter Beinecke, Jr.

A very black fox squirrel, from T. B. Upchurch, Sr., of Raeford.

December, 1943: The heaviest (25 pounds) wildcat we have recorded; secured from Carteret County.

A complete 12-volume set of the "Smithsonian Scientific Series."

February, 1944: A thirty-foot model of the Battleship North Carolina, from the Liggett & Myers Tobacco Company and Duke University.

March, 1944: A collection of Indian artifacts secured during the excavation of the Peachtree Mound, Cherokee County. These were presented by the U. S. National Museum.

An old muzzle-loading shotgun and other old farm equipment, from Cornelius Haywood Harper of Franklin County.

A mounted timber wolf, prevalent in this State up to about 1890, from the Oklahoma Game and Fish Commission, in exchange for some surplus mounted ducks.

An Eocene fossil from Camp Craggy, Wake County, by James Crawford. This extends the range of our coastal plain fossils several miles westward.

An old meat grinder of home construction, from R. S. Mullen of Crouse.

May, 1944: A series of 25 species of marine algae from Beaufort Harbor, by Horace Loftin, Jr. These are of significance in connection with the production of war scarce agar from our seaweeds.

June, 1944: A very red live pigmy rattlesnake from Pungo River, Hyde County. This extends the range of the species northward. This was presented by Harry Parkin of Raleigh.

EXHIBITS

The program for improving and adding exhibits continued on schedule until the painting and renovation program of January, 1944, made it necessary to close off groups of exhibits. However, some parts of the museum were kept clear and open to visitors every day. Exhibits that were dismantled were promptly restored and the program of improved and new exhibits has been resumed.

The largest new exhibit is that of the full-sized reproduction of the 17-foot True's Beaked Whale. This mother whale and young are the only exhibit of this kind in museums. A large thresher shark reproduction is now nearing completion.

Most popular exhibit is that of our live poisonous snakes.

The advent of military men in our camps, who come to the museum to seek information on this subject, has sustained prime interest in this exhibit.

The interest in critical war minerals has brought greater interest in our exhibits of these, especially of mica, quartz crystal, and chrome, magnesium and tungsten minerals.

Six excellent sailboat models have been refinished and re-rigged and placed on exhibit. These were developed by North Carolina builders to meet North Carolina conditions. Since about 1910 these have become rare and motorboats have taken their places.

PUBLICATIONS

The book, "Birds of North Carolina," brought out as a publication of this museum in 1941, has more than met optimistic expectations. Within two years, sales of the volume have repaid in full the private capital which was advanced to publish it. Perhaps this is a record for a State publication, even though it was not financed with State funds. It has been widely distributed among bird students and has brought definite prestige to the State and to its museum.

The mimeographed information circulars have continued to be popular items to be mailed on request to our schools, and to be selected and taken out by visitors. Some 45,000 of these have been distributed during the biennium along with 15,000 printed leaflets that give a brief story of the museum.

After our Legislature adopted the Cardinal as our State Bird, we borrowed the necessary plates and color-printed 10,000 postal cards. These were presented to men and women in uniform as a momento of their visit to the museum. These and highway maps, through the courtesy of the Highway and Public Works Commission, have been very popular with our uniformed visitors, and have introduced North Carolina to many families all over this country.

The needs of the personnel at our military posts made more urgent a long-time need for an inexpensive, clear and complete, booklet on our poisonous snakes. To serve this need, temporarily, the museum prepared a mimeographed Information Circular in 1940 and some 40,000 of these were distributed by 1944. In the meantime work was started on a convenient, printed booklet on this subject. Illustrations were the serious need.

Late in the biennium the copy and needed illustrations had been secured and this was printed.

A copy of this booklet is incorporated herewith, and your attention is respectfully called to it.

This booklet is given a nominal retail price of ten cents in order to repay the printing costs. Within a few weeks following publication, 8,000 were distributed all over this country. A second printing of 20,000 is in process and indications are that the demand for this will be cumulative for several years.

ATTENDANCE

For the two years ending July 1, 1944, 239,677 visitors came to the museum. Most of this represents a definite count and the total computation is based on this count:

	1942-1943	1943-1944	1942-1944
Sunday P. M.	18,321	26,021	44,342
Total 117,905		121,772	239,677

Despite travel restrictions, there is a perceptible increase in attendance. Much of this can be attributed to the policy of hav-



Members of Armed Services find recreation and information in State Museum.

ing the museum open on Sunday afternoons and holidays. This former was authorized by Governor Broughton in July, 1941.

Another significant fact is that men and women in uniform constitute a larger proportion of Saturday and Sunday visitors. A conservative estimate is that our Army and Navy visitors for the biennium have been 30,619. Another large portion of our visitors has been the adult relatives and friends of service men and women. These come from widely scattered sections of the United States.

In looking ahead there is every reason to estimate that museum attendance will increase by between fifty and one hundred per cent when travel restrictions are lifted. Then our large school groups will come again to Raleigh with time allotted for studying our natural history. We plan exhibits that will attract and instruct them.

In addition to actual visitors, the museum has served many thousands more by correspondence, calls, and supplying information circulars.

COOPERATIVE WORK

In keeping with our policy in using our surplus materials for aiding educational work, we have donated the following:

Fifteen mounted fishes and birds to the Methodist Orphanage in Raleigh.

One mounted bird and library material to Pineland Junior College, Salemburg.

Minerals to the National Museum of Mexico.

Some mounted specimens to the Children's Museum, in Geneva, Alabama. This Children's Museum, established by the Hornaday Foundation, is the first of its kind in the South.

To the U. S. National Museum and National Zoological Gardens, we furnished the baby beaked whale and a live albino opossum, and received in exchange some art work for our booklet on poisonous snakes.

To aid military camps, we made collections of poisonous snakes available to Camp Bragg, Camp Butner, and to the Naval Pre-Flight School at Chapel Hill, as well as the descriptive circulars.

To the Museum of Comparative Zoology at Harvard University, we supplied four North Carolina wildcats for research studies they are doing. In exchange we received a mounted Eskimo curlew, a valuable specimen of an extinct bird.

When the war restrictions precluded the annual meeting of the North Carolina Academy of Science, we were glad to aid them in their high school science program by providing the space and facilities for those students entering exhibits and projects in the contests.

We likewise provided a meeting place and other facilities for meetings of the North Carolina Bird Club and the Raleigh Bird Club.

In January, 1943, the Raleigh Natural History Club proposed a series of Sunday afternoon programs at the museum to promote interest in the natural sciences and to provide interesting and instructive hours for those staying near home because of war restrictions. These programs took the form of motion pictures and illustrated lectures held in the adjoining Department of Agriculture Board Room, on the first Sunday in each month. On nearly every Sunday this room was filled to capacity. The Raleigh Bird Club carried this on through the summer.

These activities indicate the greater and more effective educational work that could be offered by the museum if an auditorium and other facilities were available.

PERSONNEL

Our museum progress is a result of the earnest efforts of our small group of workers.

Out of consideration for our many uniformed guests, Governor Broughton arranged for the employment of Mrs. James Hunter as a receptionist-hostess in April, 1943. Events since have proven the value of this courtesy to all our visitors. Her services are also valuable in doing routine museum tasks and exercising an oversight to prevent careless damages by visitors. In view of the value of this inexpensive service to the large number of visitors, we are asking that this be continued as a part of the museum program.

Mrs. Roxie Collie Simpson left this museum in June, 1944, for a better position at the U. S. National Museum. Mr. Frank

B. Meacham was employed as taxidermist and zoologist in July, 1944.

BUILDING

As the World war inevitably draws nearer a conclusion, it is well to give thought to museums, as valuable educational extras, and to plan their future usefulness.

The Legislature of 1941 recognized the hazardous condition of the State Museum building. A committee was appointed to consider housing for this and other State agencies. This is a challenging program that can result in great future value for the State, if vision and courage are used in its solution. The successful conclusion of this war will mark the time for action.

The temporary renovation of the building interior, previously referred to, has served well for a short period, but it does not remedy the hazards in housing for a valuable collection that is in large part irreplaceable.

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